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The Canadian
Medical Association Journal

VOL. VII. APRIL, 1917 No. 4

WAR NEPHRITIS

BY ROBERT DAWSON RUDOLF, M.B.

Professor of Therapeutics in the University of Toronto

IN the present war there have been a large number of cases of nephritis which in several ways have been unusual.

Of course, wherever we get a great many individuals grouped together and they are carefully watched medically, there are bound to be a certain proportion of examples of inflammation of the kidneys seen, and such was the case during the first few months of the war. The writer was in charge of the Medical Division of a British general hospital in France in the winter of 1914-1915 and there were always a few cases of nephritis in the wards, but they were in no way peculiar. In the spring of 1915, however, examples of the disease became very common and during the summer they were so numerous as to attract special attention. In fact, so frequent did they become that a veritable epidemic of the disease might be said to have occurred. This epidemic continued all through last winter although in perhaps a slightly reduced form. It occurred in the German and Austrian armies in the same way as in ours.

A good deal has been written on this subject in the last few months and all agree in considering the disease to be peculiar in many ways, although probably few would go so far as the correspondent of the *British Medical Journal*, in France, who refers to it as a "new disease". (*Brit. Med. Jour.*, 1915, ii, p. 109.) Such epidemics have occurred before, notably during the American Civil War, but they do not necessarily occur in war, as is shown by the fact that the South African War was noted as being peculiarly free from the disease.

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The term "trench nephritis" has been commonly used to designate the condition, but, as our figures—as well as those of others—will show, the disease very commonly occurs in soldiers who have not been in the trenches at all. Probably a term less open to objection is the one at the head of this page, which was, I think, suggested by the *British Medical Journal* correspondent in France last January. The term "trench" has been used in connexion with nearly every disease that has occurred in this campaign, and usually with very insufficient reason. Probably the only good use of the word is in the disease called "trench foot".

This communication is founded upon the study of the two hundred cases of nephritis that occurred in a Canadian General Hospital in France during a year.* They form a part of the immense series upon which Sir John Rose Bradford reported in the *Quarterly Journal of Medicine* of last January. All cases of the disease occurring in France were as a military routine reported to him, and ours fully support all the findings that he records.

Ætiology. It is a common belief that nephritis is usually due to a "chill" but in the form of the disease under consideration this does not seem to be the case. Thus, during the first winter, when the condition of the trenches was at its worst and the soldiers were exposed for days on end to constant cold and wet—at the time indeed when the hospitals were largely busy with the care of thousands of cases of "trench feet"—cases of nephritis were uncommon. Then, just when the weather conditions were improving and the warm and comparatively dry climate of spring had come, they occurred in increasing numbers and this continued all through the summer. When, again, the winter had set in, although by this time the men were much more comfortable in the trenches—but still in surroundings of mud and rain that would horrify a civilian—the epidemic did not increase, but if anything lessened. So that, although believing as we do that a case of nephritis which is nearly well may be caused to relapse by a chill and should hence be kept for a long time in an equable temperature, it is evident that "chill" cannot be considered as a cause of the primary disease. Furthermore, if any additional evidence is necessary, our series shows that while the disease was rather more common in men who were serving in the trenches, still very many cases were soldiers who had not been in the trenches at all. Thus, of 192 cases 123 were

*These two hundred cases were fully tabulated by the author in a detailed chart which was appended to this article. We regret that owing to its size this chart could not be published.—EDITOR.

from the trenches, but 69 were from the positions away from the trenches. Of course, this does not quite express the true proportion, as far more men are behind the trenches than in them, but still the number of cases that occurred away from the trenches is far too large a one to allow of the conclusion that the disease is in any way peculiar to trench life.

Some of the cases (twelve in our series) give a history of previous renal trouble, but it is evident that the disease is usually a first attack. In several instances the patients had had a previous attack in France and had completely recovered only again to fall victims to the disease.

Age does not appear to be a predisposing cause in any way. The ages of our patients varied from seventeen to fifty-five, and while most of the cases occurred in young adult life this can be fully explained by the fact that most soldiers are of that age. Length of service and duration of service in France appear to have no bearing; many of our patients had only been a month or two in the country when they were attacked. Previous occupation and former diseases also seem to have no bearing.

As regards alcohol, 83 out of 152 of our cases gave a history of taking alcohol, but all were put under this heading who took any alcoholic drinks at all and most of them no doubt were moderate drinkers.

Very few of our patients gave a history of syphilis, but such records are of little value in soldiers. No Wassermann reactions were tried for, but Dr. Langdon Brown in a series of fifty-six cases of this nephritis found the reaction positive in 33 per cent., which is a much higher proportion, according to him, than prevails in the army generally. (*Lancet*, 1915, i, p. 391.)

The soldier's diet has been blamed for the disease, but although the protein element is high (180 grams) it cannot be the cause. It would act by producing an intestinal toxæmia and Mr. Mackenzie Wallis' observations (quoted by Dr. Langdon Brown) are definitely against such a toxæmia in these cases since he found neither an increase in the ethereal sulphates nor the presence of urobilin in the urine. That the diet is in some way to blame or is at least a contributing cause is rather suggested by the fact that the Indian troops in France are almost immune to the disease and yet their surroundings are in every way the same, but the diet is quite different. The German and French troops, as mentioned, are said to suffer in the same way as the British. The water supply has been suspected as being a cause, but this suspicion receives

little support as the supply is from such various sources, is sometimes chlorinated and sometimes is not so. Some have suggested that the condition may be due to metallic poisoning from the large amount of tinned foods used, but no metal has been found in many samples of urine examined. Also, an apparently similar epidemic occurred among the American troops in the Civil War and probably there were few tinned foods used in those early days. I have not seen excessive use of tobacco suggested as a cause.

The epidemic nature of the disease would naturally suggest some infection as the underlying cause. Some have believed that this infection may be a suppressed scarlet fever, but it is impossible to believe that thousands of cases of suppressed scarlet fever could occur in the army without a much larger number of the ordinary type of this infection being present and such has not been the case. Again, no case of ordinary scarlet fever occurred among the staff in our nephritis wards so that one would have to admit of a non-contagious form of suppressed scarlet fever, which makes this theory still more unlikely.

A very interesting record is given by Dr. F. F. Chandler (*Lancet*, 1914, i, p. 461) of an epidemic of albuminuria which occurred in his battalion. Case after case came to him with slight fever and often herpes labialis and occasionally œdema. He found albuminuria in many. The cases usually soon cleared up but many were sent to the field ambulance and no doubt most of these reached a base hospital. He considered the epidemic to be one of influenza.

Sore throat is not a common antecedent of the disease. Bronchitis is very common, occurring in 86 per cent. of our cases, but it seemed to be rather an accompaniment than a cause of the disease. Again, Sir John Rose Bradford states that bronchitis is very common amongst the Indian troops and they have almost no nephritis.

Numerous attempts have been made to isolate an organism from the blood in these cases but with no certain results. Various bacteria have been occasionally recovered and grown but apparently nothing specific, and in the great majority of instances the blood cultures have been negative. It may be, as suggested by Dr. Langdon Brown, that the infection is of short duration and has generally disappeared by the time the patients have reached a hospital where it is possible to do such special work. Thus, in our cases the average time before the patients were admitted to our hospital was 9·6 days. No organism was recovered in a considerable number of cases in which blood cultures were made. Again, it has been suggested that a bacilluria may be the cause, but although

occasionally a bacilluria is found to be present, usually it is absent. The type of nephritis present in the few fatal cases that have come to *sectio* has been both glomerular and tubal with some interstitial changes and white cell infiltration, all of which would suggest that the condition is due to an infection, but so far the nature of the infection has eluded investigation. The most constant infection that is present in soldiers is undoubtedly pyorrhœa alveolaris but I cannot say that this infection was more marked in our cases of nephritis than in any of the others. Still on the off chance of it being at least of some influence we had, during the last six months that I was in France, every nephritic patient subjected to dental treatment.

It has been suggested that the infection is ultramicroscopic, but so far the evidence of this is only of the negative kind, although it should be mentioned that Mr. Mackenzie Wallis was able to produce in rabbits a definite illness occurring eight days after the injections of urine prepared so as to be free from bacteria, but containing any filter passer present. The rabbits, however, did not suffer from nephritis.

Symptoms. All the classical symptoms of nephritis may occur in these cases but in rather different degrees from what they do in cases seen in civil life. We will take the symptoms in their order of frequency in our series.

1. Œdema. Œdema of the face occurred in 96·3 per cent. (184 out of 191 cases) and was very often the first thing noted. Frequently the history was that the patient had felt quite well until told by his fellows that his face was swollen. In many instances the œdema was so marked that the eyes were more or less closed. It always cleared up with great rapidity, although a good many cases had to be sent to England while it was still very evident.

Œdema of the body and limbs was noted in 89 per cent. (166 out of 187 cases) and was occasionally marked. In a few cases there was evident ascites and often some fluid in the pleuræ and œdema at the bases of the lungs. In no instance did the collection of fluid in a cavity require removal by mechanical means.

2. Headache was noted in 95·5 per cent. (182 out of 191) and was often severe. It was occasionally associated with considerable dimness of vision. In a few of the cases examined ophthalmoscopically retinal hæmorrhages were seen.

3. Nocturnal dyspnœa occurred in 78 per cent. (125 out of 160 cases) and often necessitated the patients being propped up in bed. A similar dyspnœa would also be noted in the daytime. As

regards the nature of this dyspnœa, Mr. Trevan (quoted by Dr. Langdon Brown) found the alveolar CO_2 normal in three and reduced in two from normal 5 to 3 per cent. "Since dyspnœa due to acidosis is always associated with reduction of alveolar CO_2 and uræmic dyspnœa is of this type, it would appear that the shortness of breath was not always associated with acidosis, uræmic or otherwise." It seems more probable that the condition is rather due to the œdema of the lungs, which is so constantly present.

4. Dyspnœa on exertion was present in 125 instances of the 160 cases in which this was noted (74 per cent.) but of course was a more indefinite symptom as it so much depends upon the amount of exertion and is a matter of history rather than of observation. Most of the patients were not in a condition upon arrival to permit of our trying for this symptom.

5. Cough and bronchitis were present in 76 per cent. (135 out of 177 cases) but were not usually severe enough to give rise to much distress. The sputum was nearly always free and watery. Signs of bronchitis were nearly always to be detected and frequently, as mentioned, many fine crepitations at the bases suggested œdema of the lungs.

6. A raised blood pressure was noted in 49 per cent. (77 out of 158 cases) of cases on admission. This refers only to cases in which the systolic pressure was 160 mm. and above. The diastolic pressure was noted as 100 mm. or above in 50 per cent. (77 out of 153 cases). Both the pressures were taken by the auscultatory method, the Tycos instrument being used. In some cases the pressure had fallen to normal in a few days. Dr. R. G. Abercromby (*Lancet*, 1916, i, p. 878) has noted the systolic pressure by the palpatory method in many cases and finds that it is always raised at some period; that it is higher in the afternoon than in the morning, and that as the patient improves it falls often by crisis. He states that the pressure usually diminishes *pari passu* with the amount of albumen, but not always. One would suspect that in those cases where the pressure does not fall as the albumen disappears we were rather dealing with cases of acute nephritis implanted on a chronic condition. We frequently noted that apparently the most toxic cases were not the ones that had the highest pressure. Thus five out of the twelve cases that had fits are noted as having a systolic pressure below 160 and in two instances it was respectively 120 mm. and 110 mm.

7. The aortic second sound was noted as being accentuated in 66 per cent. (87 out of 143 cases). It did not seem to be a neces-

sary accompaniment of high systolic pressure and in twenty-seven cases where it was noted as being present the pressure was less than 160 mm., while on the other hand in thirteen instances where the systolic pressure was 160 mm. or above, it is noted as being absent. This point we have often observed in civil practice.

8. The radial vessels were noted as thickened in 29 per cent. of cases (35 out of 121 instances).

9. There was more or less vomiting, either before entering the hospital or while there, in 35 per cent. of the cases (61 out of 174). Sometimes it was very persistent and there was also much nausea.

10. The quantity of urine in the twenty-four hours varied enormously, depending chiefly apparently on the stage of the disease. Many cases on admission had almost a complete suppression but in a few days a stage was reached in which the quantity would suddenly greatly increase and with the diuresis the œdema would rapidly disappear.

In some the twenty-four hour quantity was large even on first admission and here the stage of scanty urine was probably over before the patients reached us. In some this desired diuresis had not appeared before the patients were evacuated to England. Albumen was still present in the urine of 174 out of 188 cases on admission (nearly 93 per cent.). The ones in whom it was absent on admission were diagnosed by the presence of œdema, etc., and had come down the lines of communication with a diagnosis of nephritis and no doubt had had albumen at first. As regards the quantity, it is recorded on our list as large in seventy cases, moderate in fifty cases and small in fifty-four cases. In many cases it completely cleared up in a few days while in many it was still present when they were sent to England. There was no relation between the amount of albumen and the tendency to fits.

Renal casts, usually granular and hyaline, were noted in 70 per cent. of the cases. Sir John Rose Bradford, in his communication already referred to, only took the cases that had casts as undoubtedly nephritic, but in many of those in whom they were reported as absent in our series the diagnosis seemed quite likely from the presence of other signs, such as œdema and nocturnal dyspnœa, etc.

Red blood cells were noted as being present in 103 out of 177 cases (58 per cent.) and white blood cells in 46 per cent. (64 out of 138 cases).

In a very few instances blood was present in the urine to the extent of rendering this smoky or even red in colour.

11. There was often some fever on admission, the temperature being noted as 100° or above in 40·5 per cent. of the cases (74 out of 183), but it was never high. No acute complications such as pleurisy or pericarditis were noted.

12. Fits occurred in 6 per cent. of the patients after their admission to hospital (12 out of the 200 cases) and in several instances were very severe and the patients were more or less unconscious for hours. They all recovered.

A fatal issue occurred in only one case and here the post-mortem examination revealed typical granular contracted kidneys. This patient was thirty-six years of age and there was a history of previous kidney disease two and a half years before. He died in uræmic coma and did not have convulsions. The blood pressure on admission was 160-60 mm. and he had been on the sick list for forty days before he reached us. He had only been two months in France and had not been in the trenches at all. He was said to be a teetotaller.

Treatment. The routine treatment of our cases was as follows:

They were kept in bed between blankets in a ward which was carefully heated to between 60° and 65° Fahrenheit. The diet in all cases at first was "plain milk", which means six pints of milk in the twenty-four hours. Otherwise the fluids were restricted. In the slighter cases, and in all of them as they improved, the diet was soon supplemented, chiefly by the addition of bread and various vegetable foods.

A dose of one drachm of the compound jalap powder was usually given on admission and after that the bowels were kept freely open with concentrated salines. If any uræmic symptoms, such as vomiting, headaches or fits supervened, hot packs were freely used and they seemed to be of much value. Such hot packs necessitate a good deal of extra work and for this reason as well as with the object of guarding these patients against chills they were always segregated in a special ward, and here we had a larger staff of orderlies and nurses than in the average medical ward.

When suppression of urine was present dry cupping over the loins and then hot fomentations seemed useful.

Where fits occurred and they were severe, in addition to hot packs and extra purging, we bled the patients freely and this seemed to be very effectual in relieving the underlying toxæmia. As already mentioned, none of these cases died.

Pilocarpine was used occasionally to increase the sweating, and the saline diuretics were frequently given.

Prognosis. The ultimate prognosis of these cases could be better judged by the physicians whose care they came under after reaching England. Many of the slighter cases would clear up in a few days and, as said, some seemed to have already practically recovered before they reached the base. These slight and apparently recovered cases were often not sent to England at all in the summer, but to convalescent camps in France, and no doubt soon were returned to their units for full duty. But when the weather became cold and wet most of even the apparently recovered cases were evacuated to England.

Conclusions

1. The epidemic of nephritis which has occurred so generally amongst the European troops in the present war is peculiar in various ways and differs from the ordinary nephritis seen in civil life, (a) in its epidemicity, such epidemics have occurred in other campaigns, notably in the American Civil War, (b) in the low mortality in spite of frequent severe symptoms.

2. The disease appears to be due to some infection, local or general, the nature of which has not yet been determined, but probably it is of the ultramicroscopic variety.

3. Nocturnal dyspnœa is an early and very constant symptom far more so than in nephritis of the ordinary varieties.

4. The prognosis is much better than in acute nephritis of the ordinary types. The great majority of the cases soon clear up completely, but some drift into a chronic and persistent condition.

The cases in our series were under the immediate care of Captain (now Major) C. E. C. Cole; Major (now Lieut.-Colonel) A. J. Mackenzie and Major H. C. S. Elliot, and any value that this communication may have is chiefly due to their conscientious work as well as that in the Pathological Department of the hospital under Captains Duncan Graham, McKee, and Leeming.

ABDOMINAL WOUNDS AS SEEN AT A CASUALTY CLEARING STATION

By Major Edward Archibald, C.A.M.C.

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WHILE at our base hospital near and in Boulogne, sixty miles from the front, it was very infrequent to see cases of wounds of the abdomen coming in. By the time that we got to work in August, 1915, it was becoming the rule (it was far from being so in the first year of the war) to operate on abdominal cases; consequently such as came through to us had either been operated on, or if not, had been considered safe to let through, and appeared at our hospital two to six days after being hit, with secondary abscesses, or (very rarely), comparatively well. The real abdominal surgery in this war belongs to the casualty clearing stations. My own experience covered a service of close upon four months in one of these stations situated five to six miles or more behind the trenches: these were the first four months of 1916.

In order to gain a clear comprehension of the conditions under which the abdominal cases have to be treated, it will be necessary for the purposes of this paper, and perhaps not without interest to the members of the society, to describe briefly the conditions of evacuation from the trenches to the clearing station. The wounded are carried back by the regimental stretcher bearers down a communication trench to the battalion dressing station, perhaps some five hundred yards back, more or less. First aid is there given, and then, as soon as may be, the patient is transferred, first by horse ambulance, later by motor, direct to the casualty clearing station. For abdominal cases particularly, in which time was considered to be of the greatest moment, there was a standing order that whenever possible the wounded man should be immediately sent back to the casualty clearing station, even when other wounded were not ready to occupy the other three stretchers in the ambulance. Of course this was not always possible. The fre-

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quent necessity of evacuating during darkness, or a lack of sufficient ambulances during a rush, resulted sometimes in a delay of eight to twelve hours. However, in going over my records I find that the average time elapsing from the infliction of the injury to admission into the clearing hospital was from four to seven hours. In one case it was as low as two hours; in a few others it was as long as twelve; and in one case twenty-four hours.

In other respects also, the conditions of war are very different from those of peace. I think it may be said that trench fighting, while perhaps not often making any extraordinary call upon a man's muscular strength, does take it out of him most seriously in other ways, such as loss of sleep, exposure to cold and wet, the jolting of rough transport, with the consequent increase of pain, the length of the journey, the loss of blood; and all this must tell on the patient's resistance, especially, perhaps, in the case of wounds of the abdomen. As a result, the incidence of shock is very much greater than we are accustomed to see in civil practice. And when, further, one considers the nature of the wounds, inflicted as they are by fragments of shell from high explosives, and by bullets, both travelling at enormous speed, and therefore apt to produce in the intestines most extensive bursting and tearing wounds, it becomes still more comprehensible why the two factors of shock and hæmorrhage—but particularly of shock—should so often dominate the picture.

It is obvious that a certain proportion of the men suffering from abdominal injuries died on the field, or at the advanced dressing stations, from shock or from hæmorrhage. With the increase of the effort to get such cases back to hospital, the percentage of the desperate ones naturally rose; and during this past year, in contrast with the earlier part of the war, the casualty clearing stations had to cope with a larger number of moribund patients; the earliest results of abdominal work were rather better than the later ones, chiefly on this account. The latest results are again better, by reason of improved technique.

The lesions observed at operation varied from the comparatively light to the absolutely hopeless. For example, one of our patients entered with several feet of the bowel lying out upon the abdomen through a large torn wound; three of these coils were torn completely across, while inside there were several coils merely perforated, and one coil completely torn; there was a large amount of blood in the abdomen, and obviously a good deal had been lost externally, and a fair sized wound in the mesentery was found

actively bleeding. In another case a bullet traversing from side to side, had made thirteen separate holes in the small bowel and the cæcum. Occasionally in addition there would be a wound of the spleen, or of the kidney, or of the bladder. The combined wounds of thorax and abdomen we learnt to put in a class by themselves. On the other hand there were cases in which the bowels seemed to escape as by a miracle. We had several with only one perforation of a coil; in two or three others there was free blood in the cavity but no wound of the bowel. It is now thoroughly well established that there may be penetration of the abdominal cavity, even perforation, without visceral wound; and on the other hand that there may be wounds of the abdominal wall not penetrating the peritoneum but causing bleeding into the cavity and even rupture of the bowel. This is probably due to the lateral radiation of violence from the passage of a high velocity missile.

There are a few principles, or rather generalizations, which we were gradually able to form, and which have been also found to be valid by other surgeons with much larger experience than our own, particularly Cuthbert Wallace. For instance, wounds in the epigastric and hypochondriac regions from front to back, and particularly those on the right side presumably involving the liver, are apt to be of favourable prognosis, and operation can often be omitted. An exception to this concerns the wounds of the midline in which the large vessels may be hit. These are remarkable by their absence in the casualty clearing station, and the victims of such wounds presumably die on the field. Wounds of this region, however, from side to side, are rather apt to be fatal. Wounds in the hypogastric region are much more serious than those higher up, possibly because of the greater danger of injuries to the colon. Wounds of the buttocks going through the abdomen we learnt to fear very much; the reason possibly is that for a fragment to penetrate this region and enter the abdomen it is obvious that it must be travelling at a high rate of speed, and consequently is apt to produce very extensive lesions inside. On the whole wounds passing from side to side are more serious than those from front to back. When the missile had penetrated both chest and abdomen one had to deal simultaneously with a hæmothorax, often causing severe dyspnœa, and a probable wound of the abdominal viscera. In such cases we at first operated regularly, but the results were so bad that we ultimately came to the conclusion that they were better left alone, and later experience showed that of such cases a much higher percentage recovered when not touched than when operated on.

A special word should be said concerning hæmorrhage. Nearly all the cases showed some blood free in the abdomen, and most of the serious ones showed a large amount, so much so that it was frequently difficult to distinguish what part was played by hæmorrhage, and what by shock in accounting for the gravity of the patient's condition. Ordinarily one could find the source of the bleeding in a vessel of the mesentery. In one case upon delivering the intestines a large vessel was found spouting twelve hours after the injury. It was obvious that it must have stopped long before, and then recommenced upon the manipulation of operation, for the amount present in the abdomen was not more than forty to fifty ounces. This patient's blood pressure, by the way, was normal, 125 mm. Doubtless in many cases the mesenteric bleeding stops of itself. The amount of blood present in the abdomen was sometimes of course, very large; it would spurt out under tension, and flow out as if there were no end to it, giving one a feeling of desperation if there were any difficulty in finding the point of origin. But as a matter of fact it was frequently found that bleeding was not actively going on, and that the continually flowing blood was merely that which had already been effused. At post mortem in two cases in which no operation was done, I measured the amount thrown out into the cavity; in both the condition was such as is described by saying that the abdomen was "full of blood"; the amount in one case was about forty ounces, and in the other was somewhat over fifty ounces. While most of the patients in which such an amount of blood was effused showed the evidences of shock, some did not, and I thought I could conclude that few patients died of hæmorrhage alone, although undoubtedly the loss of blood contributed to the gravity of the shock already present.

The mention of shock brings me to what I think we must consider as the great cause of death in cases dying within the first twenty-four to thirty-six hours. Out of twenty-nine cases of injury to the gut of which I have analyzed the records, I find shock present in nineteen, in fourteen of which it was of severe degree. Shock of very severe grade was present in seven, all of whom died within the limits of three to twenty-two hours after operation. In all of these the pulse was very feeble or absent, the temperature would not register above 92°, the low point in our clinical thermometer, and the blood pressure was always below 80 systolic and 50 to 60 diastolic. The instances in which a man recovered with a blood pressure before operation of under 75, and a temperature below 94°, are extraordinarily rare; I do not think

that one of our series recovered, and the total of the series observed during my service was forty-three, including only cases in which the peritoneal cavity was entered by the missile. A low temperature of 94° or over, or a blood pressure of 75, might come up within the first few hours and then the patient would stand operation, though he might still die within twenty-four hours of shock, or live two or three days in other cases; but if the temperature and blood pressure showed no sign of rallying, operation was never followed even by a temporary rally. I shall speak further under the heading of treatment, on this question of operation during shock.

The clinical findings present some points of interest. It was, for instance, the rule in the Field Ambulance to give all patients ½-gr. of morphine hypodermically, and upon arrival at the casualty clearing station a ¼-gr. was frequently again given. Morphine has been used with extraordinary freedom in the war, and on the whole with the best results. However, it cannot be said that it sufficed to prevent, or even to alleviate, the serious effects of shock in the bad abdominal wounds. Doubtless it helped to prevent peristalsis and the exit of fæces into the peritoneum; doubtless it saved pain, but I could not observe that it ultimately saved life, if bad shock were present from the general wound. Distension before operation in the cases seen by us was usually remarkable by its absence; occasionally it was moderate, but never great. Respiratory movements were nearly always much limited or abolished, but this was from pain, not from peritonitis. Pain and tenderness in spite of the morphine were usually quite marked; muscular resistance and rigidity were also usually present, but never to the extent which we see in the peritonitis of civilian work. It might be thought that in conditions in which the bowels were perforated as a rule, percussion would show the evidence of free gas in the cavity; that was found rarely to be the case. I can remember only two or three instances in which the liver dulness, for instance, was obliterated, and only one in which a peculiar tympanitic note over the liver gave rise to the certitude that free gas was present. In that case on incising the peritoneum the gas came out under tension. A wound of the stomach was practically always betrayed by vomiting of blood, or of the bladder by the presence of blood in the urine.

I have already described in part the nature of the lesions found at operation. It is comprehensible that at times the difficulties of the operation were very considerable, and the danger of overlooking lesions not small. In a patient whose vitality was already

low from shock and hæmorrhage, it was often a matter of great difficulty to judge how much one should do, whether to explore further and make certain, or to chance overlooking a hole in order to spare operative shock. Here, too, experience taught us gradually what to do and what not to do. I was still grieving over mistakes when I had to leave the casualty clearing station and return to Base, but they were not those of missing lesions which happened only three times. I overlooked in one case a bad wound of the kidney and a tear on the under surface of the transverse colon above the transverse mesocolon; in another I overlooked a wound of the rectum deep in the hollow of the sacrum; and in another a wound of the third portion of the duodenum, the bullet having entered from the loin on the left side. Death, however, was not due, as we found, to overlooking such things. Except in one instance it was due to the original injury and the shock.

Wounds of the liver varied a great deal in severity. A high velocity wound would cause very extensive necrosis of tissue outside its proper track, whereas a low velocity one would frequently be borne by the patient without trouble. Bleeding from liver wounds was frequently surprisingly small, but it was found by men in Base hospitals that the later results of liver wounds were apt to be worse than one had anticipated; abscesses were quite frequent.

It was interesting to find that even after the most extensive wounds of the bowel the amount of fæcal soiling of the peritoneum was nearly always minimal. I can only remember three or four cases out of the forty-three in which there was free exit of intestinal contents. This was true even in the patient who was operated on twenty-four hours after injury. The shock of the injury doubtless paralyzes immediately the movements of the bowel, and the later exhibition of a large dose of morphine continues that effect. In a few cases there was very slight local soiling, but in the great majority the peritoneum was clean, except for a slight plastic or fluid exudate, and blood. In one case of perforation of the stomach there was an escape of blood and mucous from the entrance wound in the left loin, but in several other cases there was no escape of stomach contents whatever. Thus the necessity of early operation on account of the danger of peritonitis, which at the beginning we thought was imperative, we later concluded not to be so. This brings us to a consideration of the principles of operation.

First, as to the incision, its situation was determined, of course, often by the situation of the wound, or wounds; but as a general thing it was a vertical one in or near the middle line. There were two methods with regard to the incision which we tried out.

The one was a short, that is, a four inch incision, permitting only the peeling out and in of the bowel through most of its length. The other was a rather longer incision with immediate evisceration of the bowels in mass. The former guaranteed better against operative shock; the latter permitted quicker finding and estimation of the damage. I will only say that we ultimately decided that the shorter incision was the better. It usually sufficed to find all the lesions, and there was no doubt that evisceration was much more apt to cause death from operative shock, and also much more apt to cause paralytic ileus.

We found it best, as advised by Meyer and Taylor, to complete the examination of the gut at the beginning, putting a clamp on the wounded areas of the bowel and going on to examine the rest, so that at the end we might have several clamps on parts of the bowel separated by many feet. If one proceeded to suture holes as found, it would be discovered later that the resection of a coil bearing several perforations would have been shorter and easier. The work to be done included anything from inturning one or two small perforations on the convexity of a coil, up to two resections of one or two feet of bowel, plus suturing of numerous holes, plus perhaps packing a spleen or kidney, and tying a bleeding mesenteric artery. Our experience was that the old end-to-end suture was the quickest method of union, and quite satisfactory; quicker than closing both ends and doing a lateral union, and not productive of any greater shock. In no case did there occur leaks along the suture line. In all cases it was found advisable to put a drain to the pelvis; the effused blood was always potentially infected. Blood was generally mopped out with sponges. Irrigation was discarded after a few trials. Peritonitis after operation was not frequent as the cause of death, that was due most often to shock or ileus. We kept blood pressure records as regularly as possible.

The plan of procedure advised by the surgical consultants was that operation was indicated always, excepting when it seemed reasonable to conclude that the bowel was not injured. The condition of shock was to be combatted by rest, the application of heat and intravenous salt solution, over a period of two or three hours, after which, whether the patient had rallied or not, operation should be done, in order, as it was put, to give him his chance. Obviously, if he had rallied even partially, it was assumed to be better to interfere in order to forestall peritonitis, or to stop bleeding assumed to be perhaps going on; while if he had not rallied he was certain to die without operation, and therefore operation ought to be done. While

we doubted the wisdom of this course in cases showing no rally, we nevertheless followed out these instructions, feeling that our lack of experience ought to forbid too much dogmatism in private judgement; but before the end of the service at the clearing hospital it seemed justifiable to conclude that on the whole, when a patient was in a condition of serious, or even moderate shock, it was better to delay operation even for seven or eight hours if necessary, while waiting for a rally as evidenced in rise of blood pressure and rise of temperature, even at the risk of peritonitis or bleeding. I feel confident that some patients succumbed to the shock of operation added to the shock of the injury. In talking with other surgeons concerning this question, the opinion was expressed that operation had practically never saved a man in whom the pulse was flickering or could not be felt. This was said by one in particular whose results were the best in our region.

Another frequent cause of death was paralytic ileus. The patient would survive the operation, and appear to be doing fairly well for two or three days; but gradually distension would come on, and nothing could be got to pass the bowels; then would appear vomiting and the drawn, haggard countenance, with gradually increasing pulse rate and falling blood pressure. This condition usually led to death inside of two to four days. In two cases I carried out a jejunostomy high up in the bowel, and in one I joined the dilated small bowel to the transverse colon, but without succeeding in saving the patient in any instance, although in the two cases of jejunostomy vomiting ceased. Enemas seemed to be of no avail. With regard to pituitrin a special word should be said. Some surgeons found it extremely valuable, and declared that it did not often fail in stimulating peristalsis. My own experience seemed to show that it was very rarely of any use; but I am ashamed to confess that I was for some time unaware of the fact that, to obtain a peristaltic effect, pituitrin ought to be given into the muscle or the vein and not subcutaneously. Captain Taylor who found it most successful was particular to give the hypodermic with his own hands, and make sure that the drug was given into the muscle. Since employing it in this way I have changed my opinion, and now believe that pituitrin is a valuable help. Before I left we were able to certify to the fact that it was at times apparently a life saver in overcoming bowel atony; and I believe that my results would have been better if I had used it properly from the start.

Peritonitis as the cause of death was found in very few of the cases. It is very possible that more would have died of this com-

plication if shock and ileus had not carried off so many in the early days; still it was remarkable at post mortem to find so infrequently any evidence of advancing inflammation.

As to the results; in a series of thirty-seven cases operated on we secured thirteen recoveries, which makes a recovery rate of 35 per cent. From my conversations with some half dozen other surgeons up and down the Front, it seemed clear that the average results obtained were between 30 and 40 per cent. recoveries. Captain Taylor, however, reports as high as 50 per cent. in a series of some eighty-odd cases. Oddly enough he was in a district in which the average time from the trenches to the hospital was longer than almost anywhere else. Paradoxical as it may sound, I cannot help believing that the circumstances of a longish journey back are rather in the surgeon's favour. The very bad cases are apt not to arrive at the hospital at all, and when they do arrive, the length of time elapsing may possibly be of advantage in allowing some rally from shock. On the whole, however, with increased experience both in technique and in anæsthesia, and increased knowledge in judgement (particularly as to what cases are entirely hopeless and excluding these), the results are becoming steadily better. Rutherford Morrison, whose work has been at base in England, has asserted that a recovery rate of 60 per cent. ought easily to be obtained. But those who have had to do the work are better able to judge than Morrison, and they know that such results can only be secured by a rigidity of selection so great as to amount to real inhumanity.

In conclusion, it is a pleasure to acknowledge the great help afforded in the observation and treatment of these cases by Captain W. L. Maclean, assistant surgical specialist to the Casualty Clearing Station.

NOTES ON WAR SURGERY

By Captain Donald Hingston, C.A.M.C.

MY share in this evening's programme is to bring forward some brief notes on the wounds received in the present war, their general characters, and their treatment. It can be safely said that this war has introduced nothing radically new in the pathology, nor in the treatment of wounds. Conditions of war surgery differ from conditions of civil surgery, but the difference is not of principle but of detail and of degree.

The difference lies first, in the nature and the multiplicity of the wounds; secondly, in the severity of the infection; and, in the third place, in the wonderful recuperative power of picked young men wounded while at the height of their splendid health. If, on the one hand the infections are more virulent and the injuries more severe, on the other hand the recovery is far more rapid than that of a patient in civil surgical practice.

Wounds in this war are roughly classified according to their cause into *bayonet, gun-shot* and *shrapnel* wounds. Of course, there are besides these, fractures, dislocations, bruises, burns, etc., which the soldiers receive from falls, from being buried or burnt by shell explosions, but these are comparatively infrequent, and of no special clinical interest.

Bayonet wounds are rare. The soldier is taught to strike at vital points, the neck, or the abdomen, and the thrust is usually fatal. During the first year of its work in France, No. 3 Canadian General Hospital received but one man suffering from the wound of a German bayonet.

The German bullet is smaller but speedier than that used by any of the Allies. It weighs 154·5 grains and has a muzzle velocity of 2882 feet a second when fired from their Mauser rifle. At fairly close range it will pass through the body with a small punctured wound of entry and an almost equally small wound of exit.

Under *shrapnel* wounds are classed wounds from shrapnel shells, high explosive shells, hand grenades, rifle grenades, trench

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mortars and all other explosive shells. Men suffering from wounds of this class form the great majority of the patients in the surgical wards of the military hospitals. The foreign bodies may be large or small, the wounds may be deep or comparatively superficial, they may be simple or multiple. One patient in our hospital showed eighty foreign bodies on *x*-ray examination.

The second point of difference between war and civil surgery is the nature and severity of the infections. With the exception of a small number of bullet wounds we can say that all wounds are infected. The nature of the infection varies principally with the length of time that has elapsed since the wound has been received. At first of a milder type, it rapidly becomes more foul and more virulent. This is especially the case if the wound is deep and the foreign body large and particularly if shreds of clothing have been carried into the wound.

The number of various organisms isolated from wounds by bacteriologists during this war is very great. They vary from the mild infection to the most virulent. Anærobic and ærobic, saprophytic and parasitic all have been found. As a French bacteriologist sums it up, "the flora of the wounds corresponds to the flora of the soil and the flora of the intestines."

Preëminent in severity among the infections with which we had to deal was that known as "gas infection". This infection is caused by one or more of a group of gas-forming, putrefactive, saprophytic bacteria of which the *B. Perfringens*, also known as the *B. Ærogenes Capsulatus* of Welch, is the one most frequently found. The severity of this infection is hard to exaggerate. As a rule it begins insidiously, in some recess or pocket which has not a thorough drainage and in which necrotic tissue lies. The patient may complain of increased pain but for some hours there are no definite symptoms. Usually there is a sudden collapse which often is the first warning we receive of this dreaded infection. Preceded by a zone of attrition and devitalization of the tissues, due to the toxines of the infecting organisms, the disease spreads with a speed hard to realize unless one has seen it. In a short time there is present, besides the filthy odour of putrefaction a special sour smell characteristic of the infection, The diseased area rapidly becomes tympanitic on percussion and crepitant to the touch, toxæmia progresses and in a few hours the patient dies. Usually clear mental powers are preserved till a few moments before death. The infection spreads still more rapidly after death. At autopsies, which must not be delayed, the body is bloated and inflammable gas fills

the abdominal cavity. Even the heart, arteries and liver are full of the same bubbling gas. Although gas infection is not necessarily fatal this is a fair picture of many an unfortunate case in our military hospitals.

As regards the recuperative power of the wounded little need be said. Young men in the finest possible condition of health, they possessed extraordinary resistance and their wounds healed fast. Of 8,591 cases, medical and surgical, admitted to our hospital up to May, 1916, seventy-three died. The mortality was thus 0·89 per cent. During the same period we had thirty-eight deaths following 1,593 operations, a post-operative mortality of 2·38 per cent. Such results would be hardly possible unless the patients were in a physical condition better than is met with in city hospitals.

The following case is of interest as it shows with what speed infections may develop.

F. S., private, 1st East Yorks, admitted to A Ward, No. 3 Canadian General Hospital, August 10th, 1915. On August 9th at 2 p.m. he was struck in left buttock by fragments of shrapnel. He received anti-tetanic serum at the dressing station where his wound was dressed. He then walked two miles to the train. During the night the wound became acutely painful. On examination the following day at noon, twenty-two hours after the wound had been received, we found a jagged perforating wound. *X*-ray examination showed one large and two small fragments of shell-casing. There was a foul-smelling, bubbling discharge. Smears were taken and *B. Ærogenes Capsulatus* and *B. Tetanus* found. Immediate operation was performed by Major Hill who removed the large fragment and established very free drainage. There was a steady improvement and the patient was discharged almost well on September 5th.

The general treatment of wounds has varied to some extent during this war. In the first few months influenced largely by Delorme, ultra-conservative methods were followed. The tendency was to leave as many cases as possible without operative interference of any kind. Experience, however, has shown that by far the safest course lay in following well-tried rules of surgery. It is now generally admitted that foreign bodies lying in infected wounds should be removed, but exception may be made if the foreign bodies are very small. The most important feature of good surgical treatment is the provision of absolutely thorough drainage. In practically all the cases we had that died of gas infection or other septic infections, post-mortem examination revealed some pocket not drained or at least not sufficiently drained. It is worthy of note that most of our severe infections, especially the gas infections, originated in wounds of the thigh, inguinal region or buttocks. The reason of this lies in the fact that thorough drainage in this area is difficult. The long intermuscular planes filled by loose connective tissue offer

channels along which the infection creeps unnoticed and pocketing ensues.

When dealing with an ordinary infected wound caused by shrapnel or any other kind of explosive shell the foreign body should be removed. It is then imperative that either the wound be excised or that adequate drainage be supplied. Excision gives excellent results but this form of treatment should be left exclusively to surgeons of experience as there is danger of overdoing it and increasing the severity of the wound. So it is upon good drainage that we principally must rely.

As dressing for infected wounds two solutions have been widely used. These are Dakin's and Wright's. Dakin's solution, prepared by a simplified method and used in the British hospitals under the name of "Eusol", consists of chloride of lime (bleaching powder), boric acid and water. The proportions are 12·5 grammes of chloride of lime, 12·5 grammes of boric acid to the litre of water. This solution contains ·5 per cent. free hypochlorous acid. It has proved an excellent antiseptic especially in foul saprophytic infections and is the most widely used of all solutions in the military hospitals. Carrel uses Dakin's solution in his treatment of infected wounds. His treatment consists in introducing a perforated, soft rubber tube to the bottom of the wound. This tube may be single or branching and varies in size, shape and length to suit the various wounds. By means of this tube the cavity is gently flushed at frequent intervals with the solution. The wound is not laid widely open nor is dependent drainage established. He reports that there occurs a rapid disinfection of the wound which on becoming aseptic may be closed by suture. At No. 3 Canadian General Hospital we did not attempt Carrel's treatment. It would hardly be practical in a hospital where the personnel was so small compared with so large a number of patients.

Wright's hypertonic method consists in using a salt solution more concentrated than normal saline. The solution he recommends is one of 5 per cent., to which he adds a small quantity of citrate of soda to impede coagulation. When this dressing is used there occurs a strong osmotic current bringing serum from the body into the wound. This serum has powerful bacteriocidal action. Personally I prefer it to the hypochlorous acid treatment and base my opinion on having tried both solutions on the same patients on alternate days, on having watched the results on having enquired from the patients which dressing gave them the greater comfort.

SUBACUTE COMBINED SCLEROSIS

By Gordon S. Mundie, B.A., M.D.

AND

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THE very early symptoms associated with chronic diseases form one of the most interesting chapters in medical diagnosis, and the possibility of establishing a diagnosis at an early stage of any disease forms one of the most important duties of a practitioner.

Subacute combined sclerosis, as a disease entity, has now been recognized for some years, and its association with pernicious anæmia, more particularly, has been made the subject of many interesting communications. It has, however, been insufficiently recognized with what frequency this disease is associated with all forms of intoxication (whatever that term may imply), and particularly with many forms of secondary anæmia, other than the pernicious type.

The practitioner of medicine is confronted, so often, with ill-defined symptoms, indefinite paræsthesias, muscular weakness of the extremities, etc., conditions which are very frequently put down to a mere functional disorder, only to be found after many months to be due to a serious lesion of the central nervous system. While neurologists have already long recognized the frequency of this disease, it does not seem that practitioners in general are aware that, with greater frequency, this disease is being detected, since more attention has been drawn to the subject, and since methods of examination in nervous diseases have become more thorough. Every patient with a secondary anæmia should be examined for symptoms and signs of subacute combined sclerosis, and there is little doubt that we shall in that way get a much more reliable idea of its great prevalence.

In this paper we wish to present seven cases which we consider characteristic of the disease, and which we have chosen out of the

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cases we have seen during the last two years, either in private practice or in the public wards of the Royal Victoria Hospital. At this point we wish to express our thanks to Drs. Martin and Hamilton through whose courtesy we examined some of the patients. For the sake of brevity in the case reports we have omitted all negative points.

Case No. 1.—Male, age fifty-two, clerk, single. Admitted to the Royal Victoria Hospital March 8th, 1915, complaining of weakness of the legs and constipation. He says that one evening in February, 1914, he had a slight chill. Six days later he had severe pain in the right knee and leg associated with some swelling, redness and tenderness but no fever; slightest movement caused pain. After two weeks in bed with the use of salicylates, aspirin and colchicum he recovered. During the summer of 1914 he did not feel right; no lameness but there was a heaviness in the right leg; at times, especially in cold and wet weather, there would be some stiffness and soreness in the leg. Early in January, 1915, he was exposed to the wet and cold and had a slight chill, had to quit work and go home with a severe pain in the left leg from the knee down; leg was tender and swollen and the condition was not relieved by the use of salicylates. Two weeks later was seized with a similar pain in the right leg and over the same area as in the left leg. From this he has gradually recovered but cannot walk yet without crutches. During the last two weeks he has had some stiffness in both legs from the knees up to the lower part of the abdomen but no actual pain. He has been troubled, more or less, with constipation since last autumn. No bladder disturbances. The personal history, apart from "rheumatism" for seventeen years and hæmorrhoids for fifteen years, is negative. Denies venereal infection.

Physical Examination.—Well nourished, anæmic-looking man, younger than he looks. Teeth are composed mainly of bridge work, only slight pyorrhœa. Pupils are normal. The movements of the right leg are weaker than those of the left. Incoördination in doing the heel-knee test, more marked in the right leg. Marked Rombergism; gait is ataxic. No loss of tactile, painful, or thermic sensation, but some loss of joint-sense in the toes. The reflexes are brisk in the arms, epigastric and abdominal are active, knee jerks brisk, ankle jerks active, and there is a double extensor plantar response. The patient seems to have difficulty in expelling the contents of the rectum. The Wassermann test on the blood and cerebro-spinal fluid was negative; no increase of globulin and no increase of cells in the cerebro-spinal fluid. The blood examination showed 2,750,000 red cells, hæmoglobin, 58 per cent., with considerable poikilocytosis but no nucleated reds. The patient was put on sodium cacodylate hypo, and given walking exercises. On March 17th, 1915, examination showed 3,730,000 red cells, hæmoglobin, 58 per cent., considerable poikilocytosis but no nucleated reds. On April 16th there was very little improvement in the coördination of his leg movements and he walked poorly; blood examination showed 3,900,000 red cells, 78 per cent. hæmoglobin with poikilocytosis but no nucleated reds. He was discharged April 17th, 1915.

Case No. 2.—Female, age forty-five, married. Admitted to Royal Victoria Hospital August 12th, 1915, complaining of numbness of the legs and inability to walk. Her illness began indefinitely two years ago with a feeling of weakness and numbness in the legs; the weakness was especially noticeable in climbing stairs. After sitting for a short time her legs would feel numb and this numbness has gradually increased. Nine months ago, while in the hospital, she noticed that she did not feel the nurse rubbing her heels. Four months ago had a severe nose bleed which lasted two hours. Four months ago began to have cramps in the calves of the legs and twitching of the muscles. Has had several severe falls owing to inability to balance herself. Three months ago had another nose bleed but not so severe as the first. The numbness is becoming worse, her feet feel like rubber and when she walks it is like walking on thick

rubber pads. She has often dropped objects from her hands. She suffered from constipation and headaches. Two months ago began to have the sensation of pressure around the abdomen and costal margin which was not relieved by removing clothes. Has had attacks of a burning sensation in the feet for eight weeks.

Physical Examination.—Fairly well nourished woman, good colour, teeth in very poor condition, considerable pyorrhœa. General wasting over the whole body. All limbs are spastic but most marked in the legs. Marked ataxia in the arms and legs. Considerable loss to touch, pain and thermic sensation over the whole body and marked loss of joint sense in the hands and feet. Patient felt no pain when lumbar and venepuncture was done. Reflexes of the arms are brisk; epigastric and abdominal reflexes are absent; knee and ankle jerks are very brisk; unsustained ankle and rectus clonus; Hoffmann's reflex is positive in both hands and there is a double extensor plantar response. Marked Rombergism, very ataxic and unable to walk without assistance owing to the ataxia and spasticity. Wassermann test on the blood and on cerebro-spinal-fluid was negative, and no increase of globulin or cells in the cerebro-spinal fluid. Blood examination showed 3,040,000 red cells, 70 per cent. hæmoglobin, no poikilocytosis, and no nucleated reds. Patient was discharged August 25th, 1915, unimproved.

Case No. 3.—Male, age fifty-six, widower, merchant. Complaining of constipation and "rheumatism" in knees and calves of legs. About eight years ago, without any cause, began to have attacks of diarrhœa twice a month; he would have as many as twenty liquid stools in a day, sometimes painful, with or without mucous and blood. An attack would usually last only a few days but has been as long as ten days; at this time it was thought he had typhoid fever. This diarrhœa alternating with periods of normality continued until eighteen months ago. At that time he was operated on for a cyst of the buttock and since this operation he has been constipated; he will go several days without a movement when one dram of cascara will cause a movement, but he thinks his lower bowel is paralyzed because he has no feeling when the desire to empty the bowel comes, and if he did not rush to the lavatory he would soil his clothes. The constipation has gradually become worse. About the time of the onset of the constipation he began to have a tired feeling, even when doing very little. He has gradually become worse until now he frequently finds it difficult to walk. For years he has had weak knees and a sensation of lack of feeling in them. Lately he has become pale. No headaches. Memory has failed a great deal. Frequent micturition for three or four years.

Personal History.—He had gonorrhœa thirty years ago.

Physical Examination.—Well nourished but poorly developed man of a florid complexion. Mentally he loses the trend of the conversation very easily and is very slow. Pupils are normal; slightly nystagmoid jerkings. Motor power is fair, compatible with general wasting. Some ataxia of the hands but it is quite pronounced in the legs. Very slight patchy loss to touch in legs but none to pain. Very slight loss of joint sense in the hands but quite marked in the feet. All the arm jerks are diminished; epigastric and abdominal reflexes are active; left knee jerk is obtained with reinforcement but the right is absent; double plantar flexor response; marked Rombergism but no spasticity. Some difficulty in controlling the bowels. Wassermann test of the blood and cerebro-spinal fluid was negative and no increase of globulin or cells. Blood examination showed 2,750,000 red cells, 71 per cent. hæmoglobin and slight poikilocytosis. He was discharged October 21st and died at home December 22nd, 1915.

Case No. 4.—Female, age twenty-nine, single, teacher. Admitted May 1st, 1916, complaining of stiffness and numbness in legs and arms, cold extremities and lack of energy. Patient has been feeling below par for four or five years; at first she did not work with her usual vim, also was nervous and excitable. At times would feel quite well. This condition continued until about sixteen months ago when she began to be troubled with numbness of her hands and feet and a sensation of always being cold.

She was worse in the cold weather. Conditions gradually grew worse until January, 1916, when she had a severe attack of influenza for one month. She vomited off and on for two weeks immediately after each meal, no pain, no blood. Regained her strength slowly and while at home seemed to be doing well but on returning to work, her strength failed, she became depressed, crying occasionally and taking no interest in anything. Her appetite was good until a month ago when it began to fail and her strength seemed to go rapidly. For two years has had a profuse brownish pigmentation of the face. About Christmas, 1915, began to have some difficulty in placing her feet; they were heavy to lift and it required a good deal of effort to walk about; going upstairs was difficult but coming downstairs or hills seemed to be even more so and on many occasions she had severe falls. Rest did not improve her condition and since April 1st has been worse; has lost about eight pounds.

Physical Examination.—Pale, thin, poorly nourished, asthenic mentally and physically; marked pallor of the mucous membranes. General motor weakness with slight spasticity of the legs. Ataxia of the arms and legs. There is some loss to touch all over the body and a band of anæsthesia around the body at the fourth and fifth dorsal segments, more marked on the right side. No loss to painful or thermic sensations. Loss of joint sense in the right hand and left foot. Arm reflexes are active; epigastric and abdominal are brisk; knee and ankle jerks are brisk with a double extensor plantar response. She is unable to walk without assistance. Blood examination showed 2,400,000 red cells, 65 per cent. hæmoglobin with marked anisocytosis but no poikilocytosis, no nucleated reds. Wassermann test on the blood was negative but a lumbar puncture was not done. Patient was given massage, with arsenic and iron but very little improved. She is still alive and from reports received is in about the same condition.

Case No. 5.—Referred to me by Dr. Enright. Male, age thirty-eight, tailor, married. Admitted July 6th, 1916, complaining of weakness and difficulty in walking. Was perfectly well until Christmas, 1915, when he developed a stiffness in both knees and the left ankle, then in both large toes which was accompanied by a sensation of burning in toes and soles of the feet and a fluttering or throbbing over the outer side of the leg from the ankle to the knee. Next, the tendons behind the knee felt shortened and his knees seemed to be swollen but were not. This condition progressed gradually until six weeks ago when legs began to become weak and at the same time he had increased difficulty in defæcation. The weakness progressed until, one week ago, his legs became useless and he had to be brought to the hospital in a cab. Since admission the pain and burning sensation in the legs have increased.

Physical Examination.—Small, fairly nourished man of a very fair complexion, with an irregular mottled pigmentation over the forehead and neck. Teeth are in very bad condition. General wasting, muscles are flabby, slight spasticity of the legs; marked ataxia of arms and legs; no fibrillary twitchings but legs jerk at times. Indefinite loss to touch and pain in legs and trunk, marked loss of joint sense in toes. Arm, epigastric and abdominal reflexes are brisk; knee jerks are brisk while the ankle jerks are absent and there is a double extensor plantar response. Marked Rombergism and very ataxic in walking. Wassermann test on the blood and cerebro-spinal fluid was negative and no increase of globulin or cells. Blood examination showed 3,680,000 red cells, 90 per cent. hæmoglobin. While in the hospital under treatment the number of red cells increased to 4,250,000. He developed retention of urine followed by incontinence of urine and fæces; at times he was irrational. On September 5th, 1916, he was discharged on his wife's request and died soon afterwards.

Case No. 6.—Female, age fifty-nine, married. Admitted August 27th, 1916, complaining of headache and sick in the stomach after each meal for two months. Illness began with headache—although she has had headaches since childhood—last winter; chiefly at back of neck and frontal region. The gait has been unsteady for eighteen months and she thinks she fell downstairs and injured her back as a result of

this unsteadiness. Previously to this she used to fall off the edge of the sidewalk. More recently has been unable to walk in the dark. Her fingers have been clumsy lately, has been unable to button her clothes so well. She is dizzy on doing any sudden movement. For two years has had, off and on, indefinite sharp shooting pains in the legs, back and elsewhere; also tingling sensations in the fingers and feet. The amount of urine voided has varied a great deal but has often been delayed and in an interrupted stream; bowels have been regular.

Physical Examination.—Memory is very poor, at times cannot remember her own name. General weakness, no energy, ataxia is fairly well marked in arms and legs. Slight loss to touch in legs and loss of joint sense in hands but not in the feet. Arm jerks are active on the right but absent on the left, epigastric and abdominal reflexes are active; knee jerks are very brisk but ankle jerks are absent; double flexor plantar response; marked Rombergism. Blood examination showed 3,500,000 red cells; 80 per cent. hæmoglobin. Wassermann and colloidal gold tests on the cerebro-spinal fluid, which was under pressure, were negative and no increase of globulin or cells.

Case No. 7.—Female, age forty-five, single, milliner, referred to me by Dr. Lauterman. Complains of trembling of the body and difficulty in walking. Illness began about July, 1915, when she had queer sensations in her knees, as if they did not belong to her, and also her ankles would give way easily while she had trouble in going upstairs. She would tire out easily. Gradually the walking has become worse until now the legs are very stiff and she has to pull herself upstairs with her hands. There is numbness in the soles of her feet and ankles and a feeling of a tight band around the abdomen. Since June has had difficulty in walking in the dark and in controlling bladder and bowel movements.

Physical Examination.—Pupils are normal. Slight incoördination in the arms but on account of the spasticity and weakness, it is impossible to test it in the legs. No loss of tactile, pain, or thermic sensation; no loss of joint or vibratory sense in arms but distinct loss in legs. The arm reflexes are brisk; epigastric and abdominal reflexes are absent, knee and ankle jerks are very brisk and there is a double extensor plantar response but no clonus. Unable to stand or walk on account of the extreme spasticity. Blood examination showed 5,700,000 red cells, 80 per cent. hæmoglobin, slight poikilocytosis but no nucleated red cells. Wassermann test on the cerebro-spinal was negative and no increase of globulin or cells. Patient rapidly grew worse and died on December 15th, 1916.

In 1887, Professor Lichtheim described three cases which presented the usual clinical symptoms of pernicious anæmia but in addition all of them had also signs pointing to an affection of the spinal cord. In the first case the signs were rigidity, weakness and ataxia in the legs, with paræsthesia; the knee jerks were present but diminished and the pupils were normal. The second patient had similar symptoms, but in the third the symptoms were clinically a case of commencing tabes dorsalis. In this last case there was no autopsy, but the other two showed distinct changes in the spinal cord. There was almost complete degeneration of the columns of Goll with similar but slighter affection of the pyramidal tracts and small foci of degeneration in other parts of lateral and anterior columns. Lichtheim, thus early, regarded the changes as resulting from a toxic blood condition.

In 1889, with his pupil Minnich, Lichtheim described the

conditions found in the spinal cords of patients who had died from pernicious anæmia but in whom no symptoms of spinal disease were present during life. In none of these cases examined was the cord absolutely normal. In one half of the cases there were small sclerotic foci, which on microscopical examination were found to be the result of hæmorrhages. In the other half of the cases there was distinct degeneration in the posterior columns, differing in intensity in the different cords. The degeneration was not restricted to the posterior columns but was most evident in them. In all of them Clarke's columns, Lissauer's tract and the posterior roots were absolutely normal. The view was again expressed that the condition was the result of a toxic blood state and the changes resulting in the central nervous system from another blood state, diabetes, was referred to as analogous. In 1894 the analogy was further strengthened by the researches of Williamson, who found degeneration in the posterior columns of the cord in three cases of diabetes mellitus.

After Lichtheim's communication many excellent reports on the disease by the following authors appeared, Von Noordon, Eisenlohr, Nonne, Bowman, James Taylor, Burr, McCarthy, Mitchell, Clark and Risien Russell. In 1891, James Putnam, of Boston, described "a group of cases of system sclerosis of the spinal cord, associated with diffuse collateral degeneration occurring in enfeebled persons past middle age, and especially in women," in which he showed that the lesions of the spinal cord were not characteristic of pernicious anæmia but occur in other conditions of ill health with or without anæmia. Since then the literature on combined sclerosis has been voluminous and I have appended to this article a list of references.

In 1913, Déjèrine published an article in which he called attention to a certain type of sensory dissociation observed by him in three cases of postero-lateral sclerosis of the spinal cord, one of them coming to autopsy. The dissociation is shown in the fact that in the early stages deep sensation alone is disturbed, more particularly bone sensation and the sense of muscular position. In other words the degeneration in the posterior columns begins in the more medianly situated fibres or column of Goll and in the parts adjacent to the column of Burdach. As the disease progresses there is degeneration of the other fibres with corresponding loss of tactile sense.

Bramwell in discussing pernicious anæmia and its relation to combined sclerosis of the spinal cord, coincides with the view ex-

pressed by Collier, that the anæmia and spinal lesions are due to a common factor—probably one or several toxins—but he seems inclined to disagree with Nonne who suggests that the cord lesions are due to vascular changes brought about by the anæmia. Bramwell believes that the anæmia may precede, follow, or be coincidental with the symptoms of the spinal cord lesions, showing that these latter are in no way dependent upon the severity of the anæmia. This fact is well shown in my series of cases; the worst case, No. 4, showed no blood changes, while other cases showed only slight changes. As a rule, however, even though there are no marked blood changes in the early stages, there is usually a grave anæmia of the pernicious type before the death of the patient.

The pathological changes found in the spinal cord are for the most part confined to the white matter, and in the early stages to definite regions of the white matter. The degeneration affects primarily the posterior and lateral tracts; it commences as small areas, which eventually coalesce, forming an extensive sclerosis. It is not a system degeneration, as small areas may be found without any definite connexion with each other. Eventually there is secondary degeneration involving the ascending and descending tracts of the cord. As Déjèrine has pointed out, the medianly situated fibres of Goll's tract seem to be the first affected. In the later stages the anterior horn cells may show signs of degeneration.

The disease has been described under various names, the more common being ataxic paraplegia, spastic tabes dorsalis, ataxo-spastic tabes, subacute ataxic paralysis, combined cord degeneration, and diffuse spinal cord degeneration.

The symptoms are sensory and motor. The sensory symptoms are due to degeneration of the posterior tracts; they are paræsthesia, loss of joint sense, loss of vibratory sense, ataxia and in the late stages loss of tactile and painful sensations. The motor symptoms, consisting of weakness and spasticity in the early stages are due to pyramidal tract degeneration, which is followed in the terminal stages by flaccid paralysis owing to supervening anterior horn envolvement. Batten and Collier have divided the course of the disease into three stages: (1) Ataxia with slight spasticity; (2) Increased spasticity; (3) Flaccidity and complete paraplegia; but in the majority of cases there is no very clear demarcation between the different periods of the disease. The earliest symptoms are usually subjective, such as tingling or numbness or prickling sensation in the legs, but in other cases a tired feeling or tightness and stiffness about the legs may be the initial symptoms. In general terms the

motor power is, at first, but slightly affected, perhaps nothing more has been noted than a tendency to fatigue after slight exertion and this has been regarded as an expression of neurasthenia and treated as such. The pupils and cranial nerves are not affected. Mentally the patient may, in the late stages, have periods of delirium and confusion. The sphincters are generally involved in the final stages, either retention or incontinence of urine or fæces. In my series of cases constipation was a prominent and early complaint. Headache does not seem to be a very constant feature of the disease. A brownish pigmentation of the skin of a mottled character may be an early sign and was present in two of my cases. The reflexes may be active, increased, diminished or absent. In the early stages the knee and ankle jerks are usually increased with an extensor plantar response but often this disease has been mistaken for tabes dorsalis on account of the absent knee jerks and Rombergism. In the late stages the knee and ankle jerks are usually absent with extensor plantar response.

Treatment of the disease has not been very successful as the cause of the toxic state of the blood, which causes the spinal cord lesions and the anæmia, has not as yet been discovered. Drugs to improve the anæmia with massage and exercises for the ataxia, are employed. In one of my cases salvarsan was given, but with no beneficial results. All patients should be examined carefully for any source of infection, as pyorrhœa, pelvic inflammation, sinus infection, etc., and appropriate treatment instituted.

Subacute combined sclerosis must not be confounded with multiple sclerosis which is an entirely different form of a disease with a different history of development, clinical findings, and pathology. One is a disease found in persons over forty years of age and the other in those under forty years. One is principally a spinal cord disease while the other involves the whole cerebro-spinal system.

To sum up: Any person over forty years of age, complaining of subjective sensory symptoms, classed under the head of paræsthesias, and weakness or difficulty in walking, should be suspected of having postero-lateral involvement of the spinal cord, even though the blood examination shows no anæmia.

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MR. F. J. Winlow, of Guelph, Ontario, has been appointed assistant director of the Military Hospitals Commission.

IN recognition of his services as Assistant Commissioner of the Canadian Red Cross in France, Major Henry Woodburn Blaylock has been created by the French War Office a Chevalier of the Legion of Honour. Major Blaylock was born at Paspebiac, in the province of Quebec, in 1878. He graduated in Arts from Bishop's College, Lennoxville, in 1900, and in Law from McGill University in 1903. He has resided in England for the past few years.

DUODENAL ULCERS IN INFANCY

By Alan Brown, M.D.

Attending Physician, Infants' Department, Hospital for Sick Children, and the Infants' Ward, Toronto General Hospital; Director, Department of Child Hygiene, City of Toronto

IT is only within the past few years that duodenal ulcers have been recognized in infancy. The first case was published in 1908 and since then groups of cases have been recorded by several writers. The greatest number have been reported only during the past three years probably indicating that the condition is not a very uncommon one and that in all likelihood it has been overlooked as in other obscure affections in infancy.

Up to 1914 there have been ninety-five cases reported for study. Holt in a recent article states that in 1,800 autopsies ulcers were recorded in only four instances, and three of these cases were observed within a period of three months. Entz recorded ten instances of duodenal ulcer in 364 autopsies, and Schmidt observed twenty cases in 1,104 autopsies. A recent report by Helmholtz shows that in sixteen autopsies, duodenal ulcers were present in eight. He calls special attention to certain superficial ulcers which may easily be missed even when autopsies are made with considerable care, since they cause no symptoms during life, and neither hæmorrhage nor perforation is found at autopsy. Half of his cases belong to this group.

Granting that there is a considerable number of such ulcers which may be detected at autopsy only with some difficulty, even then we cannot assume that duodenal ulcers in infancy are at all common. However, as compared with round peptic ulcers of the stomach they are certainly much more often seen.

The average age of infants suffering with duodenal ulcers is between six weeks and five months, the greatest frequency being between the sixth and tenth week; only an occasional one has been described over five months.

Occasionally ulcers are seen in patients of any age and in those who are well nourished, but by far the greater number are of the marasmic or atrophic type. Whether there is a more definite

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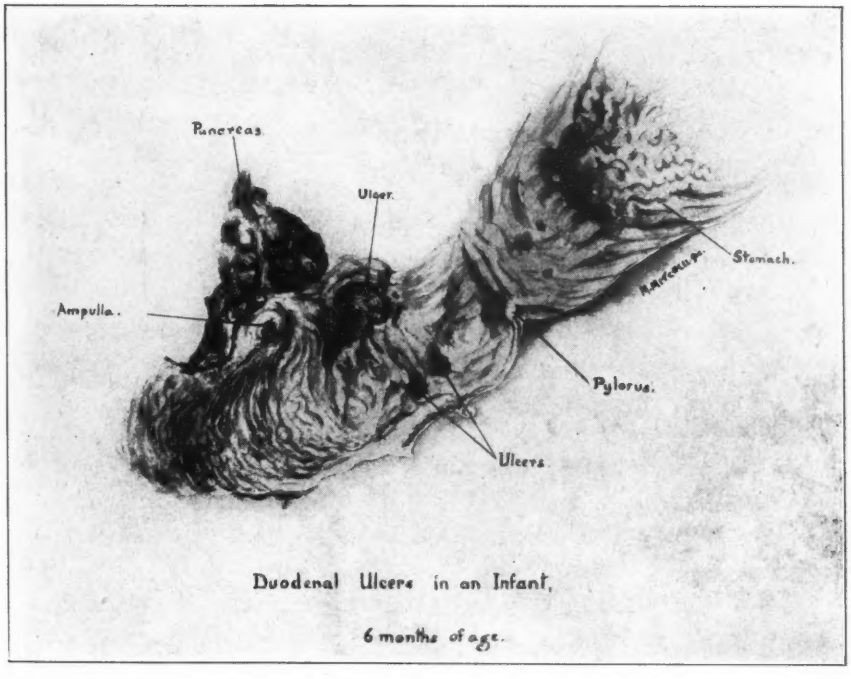


Duodenal Ulcers in an Infant,
6 months of age.

association than simply a lowered vitality, of the mucous membrane of this part of the intestines, it is impossible to say.

Two predisposing factors seem to be of some importance; a lowered general vitality of the patient, as in infants suffering from marasmus, and previous digestive disturbance, a history of which is present in a very large proportion of the cases.

The usual situation of the ulcer is in the posterior wall of the duodenum. Practically all of them are above the papilla and when but a single ulcer is present the usual seat is just below the pyloric ring. The ulcers usually occur singly although as many as two or three in one patient are not unusual.

The average size is from 1·5 cm. to 3 mm. They are invariably circular in shape, have shelving, sharp edges, frequently being described as "punched out" and often show at the base open blood vessels of considerable size. They may involve only the mucous membrane or they may go to the muscular or peritoneal coat and occasionally perforate.

The most generally accepted idea as to pathogenesis is that they are due to thrombosis followed by self-digestion of the mucous membrane over a circumscribed area. The situation of the ulcers, above the papilla, indicates that the lesion is due to the action of the gastric juice. Below the papilla the presence of the alkaline pancreatic and hepatic secretions seems to exert a protective influence on the mucous membrane of the intestine. That it is the direct action on the intestine of the gastric juice not yet neutralized is indicated by an observation of Freunde on an infant two months old, who was operated on by gastro-enterostomy for pyloric stenosis. For a time progress was favourable, then bloody stools were followed by death, the autopsy showing ulceration of the jejunum below the opening which communicates with the stomach.

Symptoms. In fully one third of the cases no symptoms are present during life, the condition being found at autopsy.

In another group of cases death occurs suddenly in collapse sometimes preceded by ordinary gastro-intestinal symptoms and sometimes not. In a few patients with such a history the autopsy discloses a concealed hæmorrhage, the duodenum, and in some cases the intestine lower down, containing large clots though no bloody discharges were present during life. In other cases there was found an acute perforating ulcer and commencing peritonitis.

The only symptom pointing to duodenal ulcer is hæmorrhage. This may appear as blood vomited or as blood in the intestinal discharges. The blood vomited may be bright clear blood, or coffee-ground material. It is not usually in large amounts. Blood from

the bowel may be in such small amounts as merely to show a trace in the stool, or large clots may be passed or even fluid blood in considerable quantity. It is then the appearance of blood in the stools, usually in considerable amounts, which first suggests duodenal ulcer, and in patients of the marasmus class or in young infants from one to five months old this cause of hæmorrhage should always be borne in mind.

Diagnosis. The gastro-intestinal symptoms preceding duodenal hæmorrhage are usually of a mild type and subacute, so that entercolitis with its frequent bloody and mucous stools is not likely to be confounded with ulcer. There is lacking also the persistent vomiting, the pain, the tenesmus with the passage of blood and mucous from the bowels, but no fæcal matter, all of which are characteristic of intussusception; although the age of the patients, the suddenness of the invasion and the acute prostration somewhat suggest it. With blood appearing both in the vomitus and in the stool one might be in doubt as to whether the lesion was gastric or duodenal. The far greater frequency of duodenal ulcers of course makes this lesion much the more probable one.

In the case of symptoms pointing to acute perforative peritonitis in an infant duodenal ulcer should be remembered as one of the possible causes and next to appendicitis probably the most frequent one.

From what has been said it will be evident that the diagnosis always has been and still is a matter of much difficulty, and it is not surprising that the disease has been recognized only at autopsy in the great majority of cases reported.

There is one method of diagnosis which I believe is likely to assist materially in these very obscure cases—the passage of the duodenal catheter. To date I have employed this method in two instances, in one case already recorded and in the instance cited below.

Prognosis. Two recoveries have taken place, in one case reported by Schmidt and another by Helmholtz, in each instance the child dying from another condition and at autopsy the duodenal scar was present. The probabilities are that such an outcome is a very infrequent one. The fatal outcome is due quite as much to the condition of the patients in which most of the ulcers are seen, as to the ulcer itself.

Treatment. Medical treatment is symptomatic only and surgical treatment has not been recorded. The case for discussion is the only instance of an attempt at treatment, namely transfusion. I think surgical intervention following transfusion should be the logical procedure.

CASE 1. Was admitted to the hospital on three successive occasions with a diagnosis of marasmus or atrophy, and on the final admission duodenal ulcer. His age on the first admission was three months and just previous to death five months. During the previous three months he had not thrived, and suffered alternately from constipation and diarrhœa, the latter being in the form of a milk carbohydrate upset. The infant during this period fluctuated between eight and nine pounds. Physical examination revealed an emaciated male infant, skin hanging in loose non-elastic folds, liver just palpable, organs otherwise negative.

From May 6th to May 12th, which was the date of the last admission, his weight remained stationary and the stools gradually reverted from the loose green type to those of a soapy character. On May 10th it was remarked that the infant looked pale and the following day the child passed four dark-coloured, almost black, stools of a tarry consistency. The test for occult blood was strongly positive. It was further observed that he was considerably weaker and more pale, he was listless, more dehydrated with respirations of 76 and pulse 104—a provisional diagnosis of duodenal ulcer with hæmorrhage was made at this juncture. Almost immediately the duodenal catheter was passed and about 5 c.c. of a bright yellow bile, filled with many brown flecks and numerous bright red flakes and streaks was obtained. This material showed a positive guaiac and microscopic test. A blood examination at this period revealed a severe degree of secondary anæmia, the red cells being but 2,900,000 and the Hb. 38 per cent. From a rough estimation we judged the infant must have lost from two and a half to three ounces of blood.

A blood transfusion was immediately performed and 150 c.c. of the father's blood introduced. Following transfusion the infant passed two fairly large currant jelly stools and died from the effects of the hæmorrhage eight hours later. Post-mortem examination showed the organs to be normal with the exception of the stomach and duodenum, the former contained a coffee-ground material while the latter was filled with one and a half ounces of blood clot of a currant-jelly consistency due to the admixture of mucous.

Situated 1½ cm. from the pylorus was a fairly large "punched out" ulcer with a shelving base. Traversing the ulcer was a moderate sized vessel attached to which was a small clot the size of a split pea. The ulcer measured 1 x 1 cm. Directly opposite this larger one were two smaller ones apparently in the process of healing as the margins were much more indurated and presented no bleeding points. Both of these measured approximately 4 mm. each.

Editorial

ON OLEOMARGARINE

POWERFUL dairying interests have had sufficient influence with their Governments to prevent the manufacture and use of oleomargarine, not only in this Dominion but in many of the States of the Union. And as long as good butter could be supplied to the public at a moderate price within the reach of all, no emphatic demand was made for any cheaper substitute. At the present time, however, with the greatly increased prices asked for all kinds of food material, and with the urgent necessity imposed by the war for economy in every household, the question is asked by many: Why should not use be made of oleomargarine, which is cheap and wholesome and has a high food value?

It is a question in which physicians are much interested and they should be acquainted with the more important facts concerning its proper manufacture and composition.

Oleomargarine had its origin in response to a desire on the part of the late Emperor Napoleon III to furnish the working classes with a substitute for butter, which would be cheaper and more stable. The prize which he offered for the discovery of such a substance was obtained by a chemist working on the Imperial Farm at Vincennes, who endeavoured by chemical and mechanical means to imitate the physiological process which he supposed to take place when underfed cows supply cream of which the fat is derived in great part from the stores in their own body. By treating beef fat first by comminution and pressure and then by the application of heat of a low temperature, and finally by the separation of the stearin and palmatin from the olein by crystallization, he obtained a fat which was free from taste and odour and melted readily in the mouth. It was found to be equally nutritious as butter and

had the advantage of having much less tendency to become rancid by keeping.

Large quantities of this new article of food were used in Paris during the siege of 1870 to 1871, and it then gained such a strong hold on the public as an article of food that Paris now consumes it in very large quantities. It is manufactured from many forms of animal fat, and from several vegetable oils, of which the most important are the cotton seed, sesame and soya bean oils. After its preparation it is washed with milk to give it the flavour of butter; in some grades of it a small percentage of butter is added.

Much has been said by those opposing its introduction regarding the poor grade of fats from which it is stated that this oleomargarine may be made. Such assertions are quite erroneous. When a fat becomes in any degree tainted it is almost impossible to remove the odour of the taint and it can no longer be used without greatly impairing the quality of the resulting oleomargarine. Oleomargarine is now regarded by all physiologists and chemists as a wholesome article of food. France, Great Britain, Germany, Austro-Hungary, Belgium, Sweden, Denmark and Italy authorize its manufacture and sale under Government inspection and control. It is especially a food product which commends itself to those who are under the necessity of practising strict economy in their family expenditure. The principal, and in fact the only objection to its use, is the possibility of fraud by the substitution of it for true butter. Legislation to provide for the official supervision of all oleomargarine made, and to ensure that it shall be sold for what it is and not for what it is not, is therefore very necessary.

FLAVINE AND BRILLIANT GREEN

THE January 20th number of the *British Medical Journal* contains a most interesting article* concerning recent experiments on the antiseptic value of certain colouring

*Flavine and Brilliant Green, Powerful Antiseptics with low Toxicity to the Tissues: Their Use in the Treatment of Infected Wounds.

matters. It has been known for some time that certain of our laboratory stains had antiseptic value. For instance, Churchman, of Yale, some three years ago published results of experiments with gentian violet which were quite encouraging. It has, however, remained for the co-workers who have taken part in the work of which this article is the outcome, to demonstrate the extraordinary efficiency of the colouring agents which go under the names of Flavine and Brilliant Green. The trouble in the past with our standard antiseptics, as these authors point out, has been that they possess also other properties which militate against efficient action in the living body, chiefly that they act as general protoplasmic poisons. As put in Cushny's words, "the ordinary antiseptics do not act more strongly on microbes than on the tissues in which they are embedded." Antiseptics are fixed by protein material in general, and hence show a much reduced potency in the presence of the serum of wounds. They also inhibit phagocytosis; by producing layers of dead tissue they supply a nidus for the proliferation of organisms.

The authors then go on to postulate the properties of an ideal antiseptic:

"1. Great potency against all microörganisms in the presence of protein material—for example, serum.

"2. No deleterious effect on phagocytosis.

"3. Absence of irritant action on living tissues in general, so that it may be applied to delicate surfaces such as mucous membranes.

"4. A suitable stimulating effect on connective tissue cells, so as to promote growth of healthy granulation tissue.

"5. The compound, when absorbed, must not be highly toxic for any specialized tissue; thus, even if strychnine were the most potent antiseptic known, its effect on the central nervous system would probably entirely preclude its therapeutic use."

As the result of their experiments which have had a very wide range, Browning and his collaborators are able to state

that they have found a compound, "flavine, which is distinctly increased in its effectiveness as an antiseptic by the presence of serum, and further, this among the substances tested is the only one of *high* antiseptic potency which more than maintains its efficiency in serum. Under these conditions, when tested on staphylococci, flavine is about twenty times more powerful than mercury perchloride, and eight hundred times more powerful than carbolic acid or chloramine-T as a bactericide."

More than this, and possibly quite as important, they have found that these two substances are strongly bactericidal in dilutions which have no inhibiting effect on phagocytosis.

A further important point concerns the effect of the antiseptic on tissues. It was found that flavine and brilliant green possessed no irritating effect on such a delicate membrane as the conjunctiva until a very high strength of the solution was reached. Flavine in particular caused no irritation above a strength of 1 in 100, whereas its bactericidal effect is seen in the fact that it kills both cocci and *B. coli* in dilutions of 1 in 100,000. Of the two, flavine and brilliant green, flavine is decidedly the better, as possessing the strongest antiseptic properties, in combination with the least effect on the tissues and on phagocytosis.

Chemically "flavine is diamino-methyl-acridinum chloride which was originally prepared by Benda at the desire of Ehrlich, and was found to have a very marked therapeutic effect in trypanosome infections. It is a fairly stable substance, and solutions may be boiled or heated up to 120° C in the autoclave."

An interesting point concerns the comparison of these new antiseptics with eusol and Dakin's solution. The authors in this connexion have the following to say: "The great value of the *chloramine* and *hypochlorite* group of antiseptics in the case of wounds appears to rest to a considerable extent on their action as solvents of necrotic tissue (Dakin, Cohen,

Daufresne, and Kenyon), and on their property of destroying toxic substances, as emphasized by Lumière, rather than on their high bactericidal potency, since, as Dakin has also shown, their bactericidal action in the presence of serum is comparatively weak (for example, chloramine-T is eight hundred times weaker than flavine for staphylococci and four hundred times weaker for *B. coli*); at the same time they interfere seriously with phagocytosis."

The article is chiefly an experimental one, but there is an appendix on clinical observations. During the preceding fourteen months, brilliant green and flavine were largely used in the Casualty Department of the Middlesex Hospital, and also in the wards; between two and three thousand patients were treated. These included about three hundred cases of septic nature and finger infections; also, large superficial infected wounds, infected amputation stumps; and on the other hand, a large number of cases almost certainly infected but treated before suppuration had occurred. A citation of details would occupy too much space. Suffice it to say that the authors come to the definite opinion that, "the results of treatment of septic conditions with flavine and brilliant green show a marked superiority over those obtained by other methods in common use. We consider that the duration of such infections is in general reduced to at least a half, that the stimulus to connective tissue to form granulations is a very outstanding feature, and that these antiseptics can be applied in considerable amounts with the minimum of interference with the normal tissue functions."

The same number of the *British Medical Journal* contains a second shorter article which reports purely clinical results*. This does little more than confirm from the clinical side the claims of Browning and his associates.

It is now generally agreed that the hypochlorite solutions of Lorraine Smith (eusol) and of Dakin represent one of the

*Flavine and Brilliant Green in the Treatment of Infected Wounds, by D. Ligat, F.R.C.S., Acting Asst. Surgeon, Middlesex Hospital.

noteworthy advances in the domain of antiseptics, and one which has already saved a great many lives in the War. It would now seem as if a further quite appreciable advance had been made. The questions which still remain unanswered in these articles concern the question of cost and of marketing of flavine. It does not yet appear whether we can in Canada procure the stains, or whether their expense is going to be a disadvantage as compared with hypochlorite solutions. A footnote, however, gives us the following information: "The preparation of flavine has been worked out by Drs. Barger and Ewins in the chemical laboratory of the Department of Biochemistry and Pharmacology of the Medical Research Committee, to whom we are indebted for the products. Arrangements have been made for the commercial production of the substance on a larger scale. The products will be tested biologically at the Bland-Sutton Institute of the Middlesex Hospital, and will be available for trial on application to Dr. Browning on behalf of the Medical Research Committee."

It appears likely that the trying out of these products in Canada would, for the present at least, be confined to the larger hospitals.

THE "AMERICAN REVIEW OF TUBERCULOSIS"

THE progress made during the past ten years in the study of tuberculosis has led the National Association for the Study and Prevention of Tuberculosis to the conclusion that the time has now come when the results of research and experience should be gathered together in a technical journal devoted exclusively to tuberculosis. No journal of this kind has yet been published in the English language, and for this reason the appearance of the *American Review of Tuberculosis* will be awaited with all the more interest. The name of the Editor-in-Chief, Dr. Edward R. Baldwin, of Saranac Lake, carries the conviction that the new journal will attain a high standard of merit and will meet all requirements. With Dr.

Baldwin will be associated as members of an Editorial Board such well-known authorities as Dr. Lawrason Brown of Saranac Lake, Dr. H. R. M. Landis of Philadelphia, Dr. Paul Lewis of Philadelphia, Dr. M. J. Rosenau of Boston, Dr. Henry Sewall of Denver, and Dr. B. S. Veeder of St. Louis. Dr. Allen K. Krause, Chief of the Division of Tuberculosis in Johns Hopkins Hospital, will be the managing editor.

THE ANNUAL MEETING

WE would call the attention of our readers to the preliminary programme of the June meeting which will be found on another page of this issue. In addition to the addresses in medicine and surgery there will be one in public health and preventive medicine, and we are glad to be able to announce that Dr. Charles J. Hastings, Medical Officer of Health, of Toronto, has consented to give it, having chosen for his subject "The National Importance of Public Health". Dr. Hastings occupies a prominent position in his chosen field of work, and we feel sure his address will be greatly enjoyed.

The President's address will be delivered at the annual dinner which will take place on the evening of the second day.

The combined sections of Medicine and Surgery will devote one session to a symposium on the subject of abscess in the respiratory tract. This is a subject of great interest to the practising physician, as well as to the surgeon, and should provoke an interesting discussion.

We would call the attention of our readers to the fact that in some of the sections particularly there is room for more papers, and would point out that it will be impossible to arrange the programme properly unless all titles of papers reach us at an early date.

Attention is also called to the instructions on the question of railway rates, which will be found in another part of this issue. We would emphasize the fact that if a large number

(300 or over) attend the meeting, our members will be returned to their homes by the transportation companies, free of charge. We would therefore urge all members whose single fare to Montreal costs more than fifty cents to secure the standard certificate from his ticket agent and turn it in at the registration bureau of the Association on arrival in Montreal.

It is proposed to erect in Ottawa a monument to Edith Cavell, and it was decided at a meeting held on January 16th to open a campaign in each of the provinces with the object of collecting the sum of twenty thousand dollars to be expended in the establishment of a fitting memorial.

A deputation from the hospitals of the province of Ontario waited upon the provincial government on March 9th, with a request that the government grant to hospitals might be increased from twenty to forty cents a day for each patient to whom free treatment is given, and that the hospitals should be empowered to collect from the municipalities the sum of $1.50 a day instead of $1.00, the amount now paid for each indigent patient. Mr. W. E. Rundle, chairman of the Finance Committee of the Toronto General Hospital, quoted statistics to show that the government grants had not increased in the last twenty-one years, although the cost of maintaining patients had risen from seventy-two cents to between $1.70 and $1.80 a day.

The following statement recently made by the Department of Militia and Defence will be of interest to readers of the Journal:

It is announced that during the twelve months ending December 31st, 1916, 167 cases only of typhoid fever were reported amongst the many thousands of men of the Canadian

Expeditionary Force in Canada, notwithstanding the fact that typhoid fever is a disease which especially affects young adults from seventeen to thirty years of age, and is endemic in all parts of Canada. This comparative freedom on the part of the Canadian Expeditionary Force is all the more striking when it is remembered that, during the Boer War, one man out of every nine in the British Forces in South Africa was invalided through this disease, and that in the Spanish-American War, of 107,000 men in the camps at Tampa, Florida, and elsewhere, who had not left the shores of the United States, 20,000 contracted the disease. The remarkable change can only be attributed to the process of inoculation. Up to the present the Provincial Board of Health for Ontario has supplied all the typhoid and paratyphoid vaccine used by the Canadian Expeditionary Force which now consists of about 450,000 men, and, altogether, almost 600,000 doses of the vaccine have been supplied free of cost.

A DEPUTATION from the medical profession of Ontario, the Trades and Labour Council, and the Canadian Manufacturers' Association, waited upon the Attorney General of the Province on January 5th, last, to discuss the promised Amendments to the Workmen's Compensation Act. The profession was represented by Dr. E. E. King, President of the Ontario College of Physicians and Surgeons, Dr. John Ferguson, President of the Academy of Medicine, Dr. Milton Cotton, Chairman of the Special Committee appointed by the Academy of Medicine to consider the provisions of the Act in its bearing upon the medical profession, Dr. Herbert Hamilton, Dr. N. A. Powell, and Dr. Griffin, of Hamilton, and Dr. Kellman, of Niagara Falls. The point of view of the profession was ably presented by Dr. E. E. King, who pointed out that provision for medical and surgical treatment of an injured man had been completely ignored in the Act and that the treatment meted out to the profession had been most unfair. Dr. King stated also that, contrary to the belief of some of

the labour representatives, doctors were not paid out of the hospital funds for attendance upon injured men in hospitals. The attention of the Attorney General was directed also to the important fact that, had it not been for the loyal assistance of the profession, it would have been impossible for the Government to enforce the provisions of the Act. The Labour representatives expressed themselves in sympathy with the demands of the profession; the manufacturers, however, appeared unwilling to assume the responsibility for any additional payment in cases of accident.

LAST year Dr. Charles McIntire resigned the secretaryship of the American Academy of Medicine after twenty-five years of faithful service. In appreciative commemoration the American Academy of Medicine decided to raise a fund, the income of which should be expended in accordance with Dr. McIntire's suggestions. As a consequence the Academy now announces two prize offers, the prizes to be awarded at the annual meetings for 1918 and 1921 respectively.

The subject for 1918 is, "The Principles Governing the Physician's Compensation in the Various Forms of Social Insurance." The members of the Committee to decide the relative value of the essays are: Dr. John L. Heffron, Dean of the College of Medicine, Syracuse University; Dr. Reuben Peterson, Professor of Obstetrics and Diseases of Women, University of Michigan, and Dr. John Staige Davis, Professor of Pediatrics and Practice of Medicine, University of Virginia.

The subject for 1921 is, "What Effect Has Child Labour on the Growth of the Body?" The members of the Committee to award this prize are: Dr. Thomas S. Arbuthnot, Dean of the Medical School of the University of Pittsburgh; Dr. Winfield Scott Hall, Professor of Physiology, Northwestern University, and Dr. James C. Wilson, Emeritus Professor, Practice of Medicine and of Clinical Medicine, Jefferson Medical College.

The conditions of the contest are:

1. The essays are to be typewritten and in English, and the contests are to be open to everyone.

2. Essays must contain not less than 5,000 or more than 20,000 words, exclusive of tables. They must be original and not have been previously published.

3. Essays must not be signed with the true name of the writer, but are to be identified by a *nom de plume* or distinctive device. All essays are to reach the Secretary of the Academy on or before January 1st of the years for which the prizes are offered and are to be accompanied by a sealed envelope marked on the outside with the fictitious name or device assumed by the writer and containing his true name inside.

4. Each competitor must furnish four copies of his competitive essay.

5. The envelope containing the name of the author of the winning essay will be opened by Dr. McIntire, or in his absence by the presiding officer at the annual meeting and the name of the successful contestant announced by him.

6. The prize in 1918 for the best essay submitted according to these conditions will be $100.00; that of 1921 will be $250.00

7. In case there are several essays of especial merit, after awarding the prize to the best, special mention of the others will be made and both the prize essay and those receiving special mention are to become at once the property of the Academy, probably to be published in the *Journal of Sociologic Medicine*. Essays not receiving a prize or special mention will be returned to the authors on application.

8. The American Academy of Medicine reserves the right to decline to give the prize if none of the essays are of sufficient value.

The present officers of the American Academy of Medicine are: George A. Hare, M.D., Fresno, California, President; J. E. Tuckerman, M.D., Cleveland, Ohio, President-Elect;

Charles McIntire, M.D., Easton, Pennsylvania, Treasurer, and Thomas Wray Grayson, M.D., 1101 Westinghouse Building, Pittsburgh, Pennsylvania, Secretary.

THE work of the British Medical Research Committee was described in an editorial which appeared in the December number of this JOURNAL. Since then the second annual report of the Committee has been published, covering the year ending September 30th, 1916. The work is divided into five departments—bacteriology, biochemistry and pharmacology, applied physiology, statistics, and clinical research.

The bacteriological work has been conducted at a British Base Hospital at Boulogne, and in the Inoculation Department of St. Mary's Hospital, London. Particular attention has been devoted by Sir Almroth Wright, the director of this department, to the study of wound infections and their treatment by salt solutions. Similar studies of the treatment of wounds by the use of hypochlorite solutions, made by Dr. Dakin at Compiègne and by irrigation with eusol prepared by Professors Lorrain Smith and Ritchie at Edinburgh have also been subsidized by the Committee; and, as the report says, surgical testimony is still divided upon the respective value of these methods.

The statistical department has continued its enquiry into the epidemiology of phthisis and the periodicity of measles epidemics, but the greater part of its time and energies has been given to the compilation and analysis of army medical statistics; the Canadian statistics are being compiled by the Canadian Army Medical Corps upon similar lines. The importance of such records cannot be overestimated for, in addition to their immediate and scientific value, they will provide the only means of checking claims for pensions in the future. This department also supplies current information to medical officers as to the later history of a case or group of cases for guidance in future treatment, or as to the immediate past

history of a case to guide present action. Moreover, valuable assistance has been rendered in the formation of a national collection of pathological specimens for the Army Medical Department.

The director of the department of biochemistry and pharmacology, Dr. H. H. Dale, has been successful in establishing the great clinical value of the double salt—emetine bismuthous iodide—in the treatment of chronic amœbic dysentery. New knowledge has been gained of the life history of the bilharzia parasite and its mode of transference in its alternate generation to the snail and from the snail to man again. It had been shown by experiments on mice during 1915 that man became infected by the passage of embryos through the skin during bathing or wading in infected water, and investigations were therefore directed to methods by which infected waters might be rendered safe. It has been found that by the addition of acid sodium sulphate, 1 in 1000 parts, drinking water could be made harmless, and that in the case of water for washing purposes the addition of army cresol, 1 in 10,000 parts, is effective, and these methods have been put into routine use in all the camps and outposts in Egypt. It has been found also that two forms of bilharziosis are prevalent in Egypt, and that symptoms of hæmaturia are due to worms spread by three species of the snail, genus *Bulinus*, whereas bilharzia dysentery, on the other hand, is due to worms conveyed through snails of the genus *Planorbis*.

Researches into the cause and prevention of cerebro-spinal fever have been conducted by Lieutenant-Colonel Mervyn Gordon, assisted by Major Hine and Dr. Flack. It has been found that the meningococci in the cerebro-spinal fluid are not strictly uniform and four main types of this organism have been described.

Standardized emulsions of killed typhoid and para-typhoid bacilli, and the corresponding standardized agglutinating serums have been prepared in the Standards Laboratory of the Pathological Department of the University of Oxford

and have been issued to the naval and military hospitals, and the preparation of standard cultures of the chief dysentery infections has also been undertaken.

Important results have been obtained from the investigation of the health of munition workers and the study of military neurological cases. Physiological tests have been made of salvarsan and neosalvarsan of French and British origin, and the Committee has been able to give valuable advice to manufacturers of these products, thereby ensuring the supply of preparations, little, if at all, inferior to those formerly obtained from Germany.

A TRIBUTE to the work of the Army Medical Services was paid in the British House of Commons by Mr. Forster, the Financial Secretary for War, in his review of army administration and work during the past twelve months. He spoke with particular satisfaction of the improvement of conditions in Mesopotamia, where the War Office is now directly responsible. In France, Salonica, and Egypt the general condition was satisfactory, although enormous difficulties had been encountered and great strain had been put upon the medical resources. The almost total disappearance of enteric fever during the present war was the more surprising when account was taken of the vast numbers of men employed, their density on the ground, and the conditions of the soil, especially in France. Cases of typhoid fever amongst the British troops had numbered down to November 1st, 1916, 1,684, those of paratyphoid 2,534, and of indefinite cases 353, making a total of 4,571 cases of the typhoid group of diseases. Mr. Forster stated also that the system of utilizing the services of the members of the Voluntary Aid Detachments had been highly successful and that the Voluntary Aid Hospitals had been invaluable in linking up the military medical system with the large number of sympathetic workers amongst the civil population.

Canadian Medical Association

ANNUAL MEETING, MONTREAL, JUNE 13TH TO 15TH

PRELIMINARY PROGRAMME (MARCH, 1917)

ADDRESS in Medicine: Theodore C. Janeway, M.D., Professor of Medicine, Johns Hopkins Hospital, Baltimore.

Address in Surgery: F. J. Shepherd, M.D., LL.D., F.R.C.S., Montreal.

Address in Public Health and Preventive Medicine: Charles J. Hastings, M.D., Medical Officer of Health, Toronto.

SECTION OF MEDICINE

J. S. Wright, Edmonton: "The sociologic and economic aspect of tuberculosis."

Robert C. Paterson, Saranac Lake: "Tuberculin, its nature and action."

J. Roddick Byers, Ste. Agathe des Monts: Vocational training in the treatment of pulmonary tuberculosis.

James Third, Kingston: "Tuberculosis, a national problem."

Hugh M. Kinghorn, Saranac Lake: "Rest and exercise in the treatment of pulmonary tuberculosis."

W. B. Kendall, Gravenhurst: "Clinical report of one hundred cases of artificial pneumothorax."

W. Goldie, Toronto: "Neurasthenia as a symptom complex."

E. H. Mason, Montreal: The value of the atropine test in the diagnosis of typhoid fever."

A. McPhedran, Toronto: (To be announced).

E. Grenier, Montreal: "Artificial pneumothorax in the treatment of pulmonary tuberculosis."

W. G. Hepworth, Steveston, British Columbia: (To be announced).

Maude E. Abbott, Montreal: "On the clinical value of the determination of basal metabolism by indirect calorimetry."

Walter M. Boothby, Rochester, Minn., and Maude E. Abbott,

Montreal: "On the basal carrying tension of the blood for carbon dioxide in congenital cardiac lesions."

G. S. Mundie and I. J. Erickson, Montreal: "Cerebro-spinal lues."

I. J. Erickson and E. H. Mason, Montreal: "Orthostatic albuminuria."

W. H. B. Aikins, Toronto: "Radium in the treatment of tuberculosis of the skin."

W. F. Hamilton, Montreal: "Pancreatic cyst, three cases."

H. A. Bray, Ray Brook, New York: "Apical breath-sounds in early tuberculosis."

Section of Surgery

James McKenty, Winnipeg: "Duodeno-jejunostomy; its indications and technique."

Robert E. McKechnie, Vancouver: "The action of wood alcohol in surgical cases."

W. E. Gallie and E. L. Robertson, Toronto: "The transplantation of bone."

Charles K. P. Henry, Montreal: "The surgical treatment of pernicious anæmia."

W. A. Lincoln, Calgary: "Spontaneous rupture of the renal artery.

A. Primrose, Toronto: (To be announced).

J. E. Lehmann, Winnipeg: (To be announced).

J. L. Chabot, Ottawa: (To be announced).

J. A. Nutter, Montreal: "Asthrodesis of the hip joint and its indications."

Lieutenant-Colonel F. G. Finley, B.E.F.: "Trench nephritis."

John Parry, B.E.F.: "Injuries of peripheral nerves."

Major S. Aylwin Smith, B.E.F.: "Technique of nerve suture."

Major G. Peat, B.E.F.: "The effect of gassing."

Major John Meakins, B.E.F.: (To be announced.)

Major A. W. W. Ellis, B.E.F.: (To be announced.)

X-Ray Section

H. H. Cheney, Montreal: "The use of *x*-ray in gastro-intestinal diagnosis."

F. S. Pepperdene, Toronto: "Treatment of diseases with *x*-rays."

Captain J. D. Morgan, C.A.M.C.: "X-ray at a base hospital in France."

Captain A. Howard Pirie, C.A.M.C.: "The inefficiency of the modern German shrapnel ball."

W. A. Wilkins, Montreal: "Pulmonary abscess."

H. M. Tovell, Toronto: (To be announced).

G. E. Richards, Toronto: (To be announced).

J. E. Panneton, Montreal: (To be announced).

The work of this section will also include a visit to the *x*-ray departments of the Montreal General and Royal Victoria Hospitals. There will be the usual interesting display of plates.

Combined Sections

DISCUSSION ON "SUPPURATIVE CONDITIONS IN THE LOWER RESPIRATORY TRACT."

(Speakers to be announced.)

Section of Obstetrics and Gynæcology

Several papers have been promised. Contributors and titles will be announced later.

Section of Ophthalmology and Oto-Laryngology

D. J. Gibb Wishart, Toronto: "Remarks upon the treatment of ozœna by means of polyvalent vaccines, after Horn."

W. G. Putnam, Yarmouth: (To be announced).

Lieutenant-Colonel S. Hanford McKee, Folkestone: (To be announced).

A. Bramley Moore, Montreal: "Injuries to the eye caused by breaking of eyeglasses."

F. Tooke, Montreal: "Complications of senile cataract extraction."

W. G. M. Byers, Montreal: (To be announced).

H. D. Hamilton, Montreal: (To be announced).

George H. Mathewson, Montreal: (To be announced).

J. E. Hett, Kitchener: "Focal infection of the tonsils."

Section of Public Health

D. Boucher, D.P.H., M.O.H., Montreal: "Teaching of hygiene; its necessity."

E. Pelletier, Montreal: "How to organize effectively a public health department in rural municipalities."

J. A. Baudouin, D.P.H., M.O.H., Lachine: "Sanitary records of houses as established in Lachine."

M. M. Seymour, Regina: "Hospitals in rural districts."

Laboratory Section

E. H. Mason, Montreal: "On the functional diagnosis of kidney disease."

Louis Gross, Montreal: "Reconstructions of circulation in the kidney and their bearing on the pathology of the organ."

D. D. MacTaggart, Montreal: "Medical jurisprudence in civil law."

Maude E. Abbott, Montreal: "Development of the heart in explanation of certain congenital cardiac defects."

Maude E. Abbott: "The Haldane portable gas analysis apparatus for the estimation of carbon dioxide in the alveolar air in the determination of acidosis."

S. J. S. Peirce, Winnipeg: "Wassermann chart with some notes towards standardization of the Wassermann technique."

C. T. Crowdy, Montreal: "On hypernephromata and renal cancers."

Henry Odland, Montreal: "Trinitrotoluene poisoning."

A. A. Bruère, Montreal: (To be announced).

W. J. Scott, Montreal: (To be announced).

Joseph Kaufmann, Montreal: (To be announced).

Horst Oertel, Montreal: (To be announced).

Exhibition of specimens.

Military Section

Several papers have been promised and these will be found for the present under the Surgical Section. The chairman of the Military Section is assured of a sufficient number of papers to make this part of the programme a success from every standpoint.

RAILWAY RATES

The usual reduced rates have been arranged on all the Canadian roads terminating in Montreal. These special rates may be obtained by doctors attending the meeting, and by members of their families accompanying them.

In order to take advantage of these rates it will be necessary for the physician when starting, first, to purchase a single first-class ticket (which must cost not less than 50c.) to place of meeting, and second, to obtain from his ticket agent a standard certificate properly filled in and signed by the latter. This must be presented to the General Secretary of the Association when registering at the meeting. It will be filled in by him and viséd by a special agent of the transportation companies, who will attend for this purpose on the 14th and 15th, and who will collect the sum of 25c. for each certificate examined. The presentation of this form properly filled in and viséd will entitle the holder to a return ticket to his home either free of charge or at two thirds, or one third, the regular first-class fare, depending on the number attending the meeting.

From points east of Fort William, Ontario, tickets must be bought between June 9th and June 15th, inclusive, and the return journey may be made up to and including June 19th, 1917. From points west of Fort William, and Armstrong, Ontario, tickets must be bought between June 8th and 11th, inclusive; from British Columbia between June 6th and 9th, inclusive. Certificates for the return journey to the west will be honoured at Montreal up to and including June 19th, 1917. A thirty-days' extension may be secured by the additional payment of one third the full fare from place of meeting to starting point. Stop-overs will be granted holders of these extended tickets.

It is hoped that our members will note that it is important to fulfil all the conditions mentioned above, and it should be emphasized that the greater the number attending, the less will be the cost of railway transportation. Any member requiring special information with reference to transportation is requested to write to Dr. H. B. Carmichael, Chairman of Transportation Committee, General Offices, Grand Trunk Railways, Montreal.

The War

RETURNED SOLDIERS AND THE MEDICAL PROFESSION

CANADIAN physicians and surgeons come in contact with returning soldiers in many ways. They meet, not only as physicians and patients, but as fellow-soldiers, fellow-citizens, and friends. In Canada, members of our profession have an unusually honoured position and have great influence in the formation and control of public opinion; for that reason, it is very desirable that an exact appreciation of the conditions under which discharged, often disabled, soldiers return to their homes should be general among us.

The war has created in Canada many needs, insufficiently provided for by preëxisting social organization. Public and private energies have produced a number of new bodies designed to meet those needs and, on the whole, the situation has been well met. In providing for the needs created by the return of our soldiers it is vital that the thing best for them and best for Canada be secured; the medical profession can do much towards generalizing a knowledge of what is the best thing that can be done by Canada for her returning soldiers.

The republican ideals of France and Great Britain are, in many ways, similar to those of Canada. The old world has been living for two and a half years in a situation which we are only commencing to feel with clear seriousness and it has adopted measures of astonishing uniformity for coping with that situation. Consequently, it is possible for Canada to gain much advantage by a consideration of measures found desirable and adopted in France and in the Mother Country. Both have introduced legislation coördinating and extending the activities of private, semi-private and public bodies preëxisting or established to care for returning soldiers. Canada has done likewise. In addition to the Canadian Army Medical Corps, which is responsible for the active treatment in the field of invalided soldiers, the Military Hospitals Commission and the Board of Pension Commissioners have been created, by the Dominion Government, to aid in caring for returning, disabled Canadian soldiers and sailors. Their work is supplemented by the Provincial Commissions which, at present, are mainly occupied

with providing employment and in otherwise assisting the replacement of returned soldiers in civilian life. The part played by the Red Cross Societies, and by the whole-hearted coöperation and assistance of private persons whose position has enabled them to help, can not be omitted from a recital of the measures by which the well-being of our disabled soldiers and sailors is being secured.

The powers of the Military Hospitals Commission are exceedingly broad. To it have been confided most matters concerning the welfare of disabled and discharged soldiers with the exception of pensions and the provision of employment. That it is realizing its responsibilities actively is apparent to everyone who reads its Bulletins; copies of them may be obtained on application to the Secretary of the Commission in Ottawa.

To the Board of Pension Commissioners for Canada has been confided the responsibility of administering the legislation by which Canada gives to her disabled men pensions of unequalled generosity.

By their personal influence, no less than by their professional services, the medical men of Canada can do much to assist these bodies, and the many semi-official, official and private bodies coöperating with them, in securing adequate provision for returning Canadian soldiers. For the convenience of presentation, the processes by which a wounded, or otherwise disabled soldier or sailor, is cared for and returned to his home may conveniently be described in five divisions: they are—

1. Active medical and surgical treatment.
2. Functional reëducation.
3. The provision of artificial appliances.
4. Vocational reëducation, and
5. Establishment in civilian life.

Although these five divisions are named, they are not, in reality, separate processes; nor can strict lines be drawn between them. All are intimately inter-connected and must often be active coincidentally during the progress of a disabled man from active service to reinstatement in civilian life.

Active medical and surgical treatment is secured to Canadian soldiers requiring it by the Canadian Medical Service. The exigencies of war make it impossible for Canadian soldiers always to be cared for by members of the Canadian Army Medical Corps. Injured soldiers are cared for, first of all, by the Medical Corps unit responsible for the area in which they have received their injuries. So it happens that Canadian soldiers often receive first aid, and

are for some time, in units and hospitals, maintained by medical Services other than their own.

It is quite unnecessary to publish anything in the CANADIAN MEDICAL ASSOCIATION JOURNAL concerning the personal equipment, organization, or work of the C.A.M.C.; its readers have been informed constantly of these things month by month since the beginning of the war. The system by which men disabled in France are cared for and brought to England is well-known. Well-known, also, are the hospitals in which disabilities of an ordinary type are cared for. Less well-known are the institutions established for the purpose of dealing with injuries and diseases of an unusual nature. The large numbers for which the Medical Service cares have made necessary the establishment of hospitals to care for men whose affections require special treatment.

Among the most interesting of these special hospitals are the orthopædic centres to which men severely, often permanently, disabled by wounds are sent for final treatment. In them, secondary operations made necessary by adherent scars or nerves, by unsuitable stumps, by persistent infection or similar conditions are performed. To them go, also, men suffering from deformities which operation or continued treatment may remove. Very useful work has been done by the first of the orthopædic centres established by the Canadian Army Medical Corps at Ramsgate.

Functional reëducation is a term under which may be grouped all of the means adopted to secure the persistence of a maximum of normal function to an injured part; in military, as in civilian practice, judicious reëducation is advantageously commenced after an injury so soon as it is possible to do so. Usually, however, it is not until a patient reaches an orthopædic centre that functional reëducation is really commenced. The treatment by which the functional reëducation of each case is accomplished is most carefully selected. The French orthopædic centres are equipped for active and passive mechano-therapy, for treatment by galvanic, static, Faradic, and high tension electric currents, by vibration, by bathing, by blasts of hot air, by baths of many kinds, by coloured lights, and by massage, gymnastics, and exercises of various sorts.

European opinion is almost unanimous in insisting upon the prime value in functional reëducation of active movement, commenced and controlled by the patient. At first, the exercises given are simple ones, such as those used in the reëducation of tabetics; these are also of great benefit to men who are awkward

and unaccustomed in their movements after an amputation or long confinement in bed. Gymnastics and more violent exercises follow; they, with the employment of machines worked by the patients themselves have quite superseded the use of passive motions obtained by machines driven by motors.

The curative value of properly-selected and properly-graduated work has been recognized everywhere. Work, when controlled by physicians, has not only a high therapeutic value in accustoming disused and damaged tissues to their function; but it has also a high psychic value. While work reaccustoms muscles to action, it reaccustoms minds to the idea of self-supporting labour. It is for this reason that hospitals,—in all of the great warring nations,—provide facilities for work, often under the auspices of a voluntary society; in this way patients, always under the control of physicians, may engage actively in occupations by which remuneration may be earned. In some of the French hospitals supplies are made for the government by patients who are paid for their work; they make magnesium lights, and do simple machine work such as the stitching of towels or of comfort bags. Not the least of the advantages, offered by a system such as this, is the opportunity which it affords the officials concerned with vocational reëducation to recognize a patient's aptitude; it facilitates the making of a sound and early choice of a new occupation for a disabled man who should not attempt to resume the employment which he followed before he became a soldier.

The provision of artificial legs, arms, and other appliances is an important matter; about 3 per cent. of the Belgian wounded have lost limbs and at the middle of 1916 there were about 50,000 men in France who had suffered amputation. The French estimate that about 1 per cent. of their wounded will require an artificial appliance of some sort.

The obligation of the State to provide appliances for one of its disabled soldiers is but a part of its obligation to use every means for bringing his disability to an irreducible minimum. The State must supply any appliance that may be necessary and should maintain it in repair; the appliance supplied must be of the highest quality and the one most apt to the purpose. Much has been learned concerning artificial appliances since the commencement of the war; not, perhaps, so much in the discovery of new devices as in a wider realization of the fact that the best appliance is the one which is most useful to the man who wears it. The best artificial leg, for example, is by no means necessarily the most expensive one, the

best-looking one, or the first choice of the man, inexperienced in such things, who is to wear it.

In order to secure uniformity and high excellence in the artificial appliances supplied to disabled men and kept in repair for them by the Government, France has requisitioned all artificial appliances made by her manufacturers; and the Government has established a series of types of artificial limbs, etc., which alone may be supplied. In this way, while a wide choice is left to orthopædic surgeons in the selection of artificial appliances, all the evils of commercialism have been avoided.

The continental governments supply, broadly-speaking, two main types of artificial limbs to their mutilated soldiers. There is the rough, strong arm or leg for heavy work and the more or less elaborate one for lighter employment; the chief use of the latter type of limb is that it disguises a loss. In limbs which are often supplied, a combination of the two types is effected, so that a man has a useful, strong instrument for work and, by the addition of an appropriate attachment, is able on occasion to dissimulate his loss. The more elaborate mechanical limbs, such as the arms enabling an armless man to strike matches, take off his hat, etc., are, at present, useful especially for those engaged in light employment and for those who have lost both arms.

In Australia, since the dependence of a disabled man upon his artificial appliances is recognized, those who have lost arms or legs are supplied with duplicate limbs so that they will have always one in reserve, ready for use, should the other be broken. The French Government is providing for the repair of the thousands of artificial appliances which its people will wear for half-a-century to come by the establishment of manufacturing orthopædists throughout the country. Men receiving artificial limbs will be given a fraction of the cost of their appliances annually with which to keep them in repair.

In its own workshops, the French Government produces artificial limbs at a cost of less than one-third of the usual retail price. The Canadian Government has also established a plant for the manufacture of artificial limbs in connexion with the large Central Military Hospital for returned soldiers at Toronto. The advantages of having a workshop, in connexion with an institution where there are large numbers of men requiring prosthetic appliances are obvious. Such an arrangement ensures the delivery of properly-fitting appliances to their wearers within a reasonable period and makes it easier for the surgeon to be certain that his directions have been followed by the makers of artificial limbs.

Vocational Training is the term applied to the instruction given to disabled men in order to prepare them for the occupations to which their aptitudes and social circumstances make them most suited. In France, it has been estimated that about four-tenths of one per cent. of the wounded will require vocational re-ëduca tion; since it will be inadvisable for them to follow their former employments.

It is extremely important, from every point of view, to ensure an opportunity to be self-supporting to every disabled man. The after history of those who have received monetary compensation, alone, for injuries incurred through industrial accidents shows that the rehabilitation of an injured man connot be secured by the mere payment to him of a sum of money. Disabled men who receive money alone, and are not assured an occupation, almost always deteriorate and lose their social position. For that reason, the rehabilitation of an injured soldier cannot be secured by bringing his disability to an irreducible minimum and by the payment to him of a pension; to discharge its indebtedness to him his country must, in addition, make him employable, by appropriate reëducational training, if military service has deprived him of his occupation, and must help him to find employment.

The selection of an occupation suitable for him is of paramount importance to a disabled man. His choice must not be made lightly. He must be guided and assisted by those expert in the estimation of abilities and in the advising of vocations. The aim must always be to select for a disabled soldier an occupation in which, by superior training and knowledge, he will be able to support himself, in spite of his physical handicap, in competition with sound workmen. It is a difficult thing to do, since a mutilated man can never be the physical equal of one who is sound; for that reason, it is necessary to furnish a disabled man with knowledge sufficient to give him an assured position. Often, it is possible to make a man capable of directing others by giving him further instruction in an occupation already familiar to him; he is then, consequently, placed in a position either to become an overseer or an employer of labour.

It is essential that the occupation of a disabled man should be carefully chosen. Past experience makes it certain that the present spirit of gratitude and sympathy towards disabled soldiers will not always survive. It will diminish, and perhaps disappear, in a few years after the war when the economic struggle once more becomes keen. Competition will be acute, then, and unless a disabled man

has chosen his occupation wisely and is master of it his position will be most unfortunate.

It is by no means necessary for all disabled men to receive vocational training; but, when it is necessary, training should commence early so that a habit of idleness may not be formed. There are many whose occupations or social circumstances make it advisable for them to return to their homes and to their normal activities so soon as may be. No disabled man, less fortunately situated, should be permitted to return to his home until he has been placed in a position where he is capable of supporting himself. It must be remembered that only those with expert knowledge can accurately estimate the capacity of a disabled man for a given occupation; consequently, only they can wisely advise a disabled soldier in his choice of an occupation. To do so requires an intimate knowledge of the state and probable trend of the labour market in the locality where the soldier intends to live, of the operations performed in an occupation and both of the way in which a soldier's injuries interfere with the performance of that operation and of means by which that interference can be removed or avoided. Such knowledge is possessed by those constituting the Disabled Soldiers' Training Boards established by the Military Hospitals Commission for the purpose of assisting soldiers in their choice of occupation and for the purpose of directing and controlling the instruction received by disabled soldiers.

Functional reëducation, vocational training and the provision of artificial appliances are complementary processes; consequently it is advantageous that they should be carried on, coincidentally, in a single institution—in a centre of reëducation. The Central Military Hospital at Toronto is an example of such an institution; there are many with similar functions in France. In them French soldiers are measured for and supplied with artificial appliances while they are undergoing functional reëducation and vocational training. In this way, all of the operations connected with the return of a man to civilian life proceed concurrently and uninterruptedly without loss of time until he is ready to return to civilian life.

A certificate of capacity is given to soldiers who have satisfactorily received vocational training. The utmost care is taken in maintaining a high standard of efficiency in those to whom certificates are granted, in order that employers may feel safe in relying upon the competence of those possessing them. In France, every effort is made to enable disabled soldiers to go directly from a

centre of reëducation to an employment. It has been found that, if they do not find remunerative occupation so soon as they are ready for it, they are apt to become discouraged and to accept their incapacity as a permanent disability, instead of as a stimulus to unusual effort.

At first, in France, as in England, disabled soldiers were loathe to undertake a course of vocational training which involved a stay of several months in an institution. The advantage gained by the training was soon appreciated, however, and, in France, that disinclination has disappeared. Now, the situation is quite changed and men ask for and insist upon receiving the instruction provided for them. They have come to appreciate everything which secures renewed independence to them. The most successful of the Institutions devoted to vocational training are residential and are strictly regulated; it is found that men, far from resenting discipline, welcome and are anxious to maintain regulations when the advantage of them is understood.

While France commences the vocational training of disabled soldiers in hospitals and has established special "centres of reëducation" for that purpose, full use is made of educational institutions already existing. Unfortunately, the number of disabled men who can be taught in existing technical schools is not very large; if a considerable proportion of those attending these schools are disabled soldiers the ordinary running of the institution is interfered with and made impossible. Arrangements have also been made by which disabled men may obtain instruction through apprenticeship or employment in business houses. In order to stimulate disabled men by example and to prove to them that men disabled like themselves can be successful the teachers instructing disabled soldiers are, as far as possible, themselves chosen from among disabled men.

It is fully realized that one of the most important of the functions of a centre of reëducation is to secure a proper outlook and a spirit of cheerful hope to its inmates. Depressed by suffering and overcome by a knowledge of their incapacity they are often downcast; they are prone to believe that they can never again be self-supporting. Since the importance of a proper mental attitude in wounded soldiers is recognized; every effort is made in the French hospitals—by the counsel of physicians and nurses, by pictures posters and instruction of all sorts—to spread the knowledge that men, though disabled, can by appropriate reëducation become self-supporting. Every means is taken of informing men in hospitals of

the measures designed for training them, for—when it is necessary—making them employable, for providing employment for them and for pensioning them in accordance with their incapacities. Very important is it to let it be known that men undergoing vocational reëducation are paid for their work.

"Establishment in civilian life" is the title given to the last of the five divisions under which the processes by which a disabled soldier is cared for and returned to his home are described. Under this heading fall, in addition to pensions and the providing of employment, such matters as the settlement of returned soldiers upon the land, the establishment of means by which returned soldiers requiring capital or credit for the commencement of farming or other activities may obtain it; these things do not exhaust the list of matters to be considered in connexion with the establishment in civilian life of returning soldiers.

At present, it is difficult neither in Canada nor in France for returned soldiers to find employment. There is much more work to be done than there are hands to do it. Both nations have made it easier for returned soldiers to find employment by a decree that Government employment, other things being equal, always shall be given to returned and disabled men or to their dependents. That such a preference should exist is just. Nevertheless, it seems very unadvisable that any machinery, such as a system of employment agencies, established for providing returned soldiers with employment should deal with returned soldiers alone. Whatever machinery is used, should be employed in providing employment for all citizens, whether they are returned soldiers or not. Should it be otherwise, the tendency will inevitably be to consider returned soldiers as a class by themselves. Although such an understanding would have no ill effect at present, it could not fail but be detrimental to returned soldiers in the future; when the war is over they must find employment in competition with men who are whole. If they find employment through machinery other than that used by sound men, the tendency—because of their incapacity and its consequent pension—will be to treat pensioners as an inferior class of labour to be hired at rates less than those earned by ordinary workmen.

The system by which France expects to meet the problem of finding employment for the thousands of men who must be returned to civilian life at the end of the war is very similar in its organization to the system of employment bureaus existing and operating in Great Britain under the Board of Trade. The essential feature

of that system is that it possesses branches throughout the country which are closely in touch with one another; these branches advance transportation to men who are travelling towards employment.

Soldiers who are entering upon civilian life will often require assistance in order that they may be established, ready for work, in a workshop or on a farm. The artisan will require tools, material, and money to secure his subsistence until his business is established; similarly, the farmer will need help in purchasing live stock, tools and seed before he can commence to live by his land. The French, with admirable foresight, have made arrangements by which men undergoing reëducation are enabled to earn money so that they may have a small capital when they leave the centres of reëducation. Proposals have also been made to create a special bank for the purpose of providing financial assistance to soldiers who will require it on their re-entrance to civilian life.

France has made arrangements by which the cost of accident and life insurance and of similar services, where price depends upon normal probability, will not be increased to disabled soldiers. It is necessary that some such arrangement should be made, since employers will hesitate to engage partly disabled men who, by reason of their incapacity, are more liable to accident, and for the same reason will suffer more severely from a given injury than would a man who was sound. An excellent illustration is supplied by the case of a man who has lost an eye. A one-eyed man is more exposed to accidents than one who has two eyes, and if a one-eyed man loses the eye remaining to him the accident which deprives him of it leaves him not one-eyed but totally blind.

Pensions, purposely, are mentioned last among the matters discussed under the "Establishment in Civilian Life". They are mentioned last to emphasize the fact that though pensions are often discussed, they are in reality a very small and comparatively unimportant part of the procedure by which a soldier is rehabilitated. From the point of view both of the disabled man and of the State, the importance of his pension is as nothing compared with the importance of securing an ability and an opportunity to be self-supporting to a soldier who has been incapacitated by military service.

The principles governing the granting of a pension are clear. France, a democratic country like our own, has expressed them well. She is fighting a national war in which each of her citizens has equal interest; therefore, all personal detriment resulting from war should be equally distributed among her citizens. Pensions

are awardable to disabled men in direct proportion to the extent of the incapacity caused by their service. The amount of the pension received by a man who is totally disabled must be sufficient to support him and his family in decent comfort. The amount of pension awarded to a partly disabled man depends entirely upon the degree of his incapacity; it is in no way influenced by his social position or earning power. A pension is the inalienable right of the individual to whom it is awarded; it can be diminished for no reason other than a lessening of the incapacity in respect of which it is granted. Since pension is awarded to a man because of an incapacity resulting from military service, it is reasonable that pension be refused to a man who has been incapacitated by his own wilful misconduct or viciousness. For the same reason, pension is denied to a man who unreasonably refuses some simple treatment by which his incapacity might be reduced or removed.

In France, as in Canada, the value of the pensions granted is greater than ever before. One of the reasons which has supported the increase in the amount granted to pensioners is the conviction that it is desirable to avoid the construction of homes for old soldiers. It is, of course, inevitable that there will be a small number of discharged soldiers who, although receiving pensions, will be incapable of looking after themselves entirely and can find no place in existing institutions or with friends. Such persons will be those violently insane and those requiring constant attention for other reasons; for them, it may be necessary to establish special institutions. The vast majority of French pensioners would not consent to become inmates of any institution established for them; the soldiers serving in the armies of France are men accustomed to home life; the soldiers for whom past generations established Les Invalides were professional soldiers who had spent most of their lives in barracks, and had never had homes of their own. It is much more in accordance with modern social organization to give disabled soldiers a pension of an amount sufficient to secure them decent comfort in their own homes or as boarders and lodgers in private families.

While it is desirable that private benevolence should have an opportunity of assisting men returned from our armed forces, it is quite certain that the unorganized activity of individuals and of small incoördinated societies inevitably results in unnecessary waste and in useless expenditure of the national resources; consequently, French legislation controls the activities of private societies and individuals. Persons and societies are permitted to accept

contributions for purposes connected with the war only when they have received permission to do so from the Government. It is, moreover, probable that a central body will be organized in each Department of France to have the sole control of all activities connected with the care of returning soldiers and with similar matters.

In France, certain individuals, by generous subscriptions and other means, are endeavouring to secure a personal following among the members of returned soldiers' societies in order to further private political ends; but the whole country is so closely bound together in unity of purpose that there seems to be no danger of ex-soldiers uniting in organized societies in order to secure privileged advantage to themselves by political action. None the less, wounded men will be strong in insisting upon their rights. For that reason—in Canada as in France—there should be an accurate appreciation in the national mind of exactly what those rights are.

Conclusion

Canada is fighting a national war; for that reason the detriments incurred by Canadian soldiers should be distributed as equally as possible among all Canadians. Only the rehabilitation of men who have suffered personal detriment by reason of their service is considered here; discussion of the equalization of economic detriment is avoided.

To secure the equitable return to civilian life of men who have been disabled by their service is a work of large dimensions. It can be accomplished best under the control of specialized agencies each closely connected with the field of its responsibilities. Since the rehabilitation of disabled men is a temporary operation, permanent machinery should not be created for effecting it unless a permanent use for that machinery exists; therefore, existing institutions and public services should be employed in caring for disabled men whenever it is possible to do so. While private benevolence may be advantageously employed it should find no essential place in providing the gladly-given advantages which disabled men receive as a right from their fellow-citizens.

All measures adopted for returning disabled men to civilian life should tend to place them, in the best and quickest manner, in an independent position in civilian life; any delay in doing so dependent upon administrative difficulties, is inadmissible. Matters important in the reinstatement of a disabled man in civilian life are, active medical and surgical treatment, functional reëducation,

provision of artificial appliances, professional reëducation, provision of pension, assistance to employment, advancement of capital, settlement upon the land, etc. All of these matters have been alluded to in preceding paragraphs.

There remains one matter so far undiscussed: that is the recognition, by soldiers and public alike, of the Military Hospitals Commission, the Provincial Commissions, and the Board of Pension Commissioners, as bodies entrusted with the duty of watching over the interests of discharged soldiers. It is desirable that every Canadian should realize that these bodies are trustees appointed to care for returned men. They serve returned soldiers and sailors. It is their duty and aim to voice the needs and to watch over the interests of returned men with all of the emphasis that their responsibilities enable them to give. The problem of securing the proper return of discharged and disabled men to civilian life will be made less difficult if a knowledge of the duties of these bodies and of the measures by which disabled men are cared for become general. There cannot be a proper frame of mind and a right understanding of their position among returning men unless they and the general public are familiar with the measures by which the personal and social rehabilitation of disabled soldiers is secured; there must be a general appreciation among Canadians, not only of that which Canada owes her disabled soldiers, but of that which a disabled soldier, still a citizen, continues to owe to his country.

In Canada, the medical profession can perform a work of great public value by constantly endeavouring to spread a proper understanding of these matters. Soldiers and civilians alike should realize that it is not only to the advantage of disabled men to accept all that treatment and training can do for them; but that it is their duty to do so. Canada owes them rehabilitation and reinstatement in civilian life; but they, like every Canadian, owe their country a willingness and an endeavour to be self-supporting to the extent of the capacity that remains to them.

Major, C.A.M.C.

Miscellany

Book Reviews

FOCAL INFECTION: THE LANE MEDICAL LECTURES. BY FRANK BILLINGS, Sc.D., M.D. Delivered on September 20, 21, 22, 23, and 24, 1915. Publishers: D. Appleton and Company, New York and London, 1916.

"THE Lane Medical Lectures for 1915" of the Stanford University Medical School in San Francisco, by Dr. Frank Billings, of Chicago, have been issued by Appleton in book form, and constitute a valuable contribution to our knowledge of focal infections. In fact they represent an excellent monograph on focal infection. Dr. Billings is to be congratulated, first of all on his success in developing his scheme of team work among the various departments, clinical and scientific, of the Rush Medical College with the University of Chicago and the Presbyterian Hospital. It is rather a new thing, and rather a fine thing, to have been able to get so many widely separated men, all of them engaged in other work of immediate interest to themselves, to become enthusiastic over, and help in, a a piece of work such as this, which obviously needs the coöperation of widely varying departments. Chicago has set a good example in this respect.

Dr. Billings takes up in these lectures the general consideration of focal infection; then, in particular, the streptococcus pneumococcus group; then the acute and chronic diseases related to, or dependent upon, focal infection, and finally, treatment, ending up with a very good bibliography. The whole constitutes an excellent monograph. The conclusions drawn possibly at times go a little beyond the evidence, or, at least, would appear to do so in the opinion of some; but on the other hand it is certain that in the past we have far too little regarded the influence of hidden local infections in the production of acute and chronic general diseases.

Dr. Billings includes in his list of diseases related to focal infection the following: acute rheumatic fever, rheumatic endocarditis, myocarditis and pericarditis, chorea, acute systemic gonococcus infection, malignant endocarditis, acute nephritis,

acute appendicitis, cholecystitis, acute gastric and duodenal ulcer, acute pancreatitis, erythema nodosum, herpes, spinal myelitis, acute osteomyelitis, thyroiditis, iridocyclitis. Under chronic diseases dependent on focal infection he includes, chronic infectious arthritis, chronic infectious nephritis, chronic cholecystitis, chronic peptic ulcer, chronic infectious endocarditis.

A great deal of the argument rests upon the observations of Rosenow, now so well known. Whether time will prove that the mode of infection here described as valid in such things as appendicitis, cholecystitis, gastric and duodenal ulcer, acute pancreatitis, and a number of other diseases, is to be enlarged to cover such a big proportion of these diseases, may perhaps be questioned. It is fairly certain that they depend in many instances upon other modes of infection than hæmatogenous and lymphatic routes here described proceeding from foci of infection in the body. Nevertheless, clinical evidence as gathered in all big hospitals now following the lead of the Chicago men, goes to show the very great value of hunting in all obscure cases for hidden foci of infection. Cure often follows upon such a discovery and the appropriate treatment.

The book is cordially to be recommended, not only to surgeons and internists, but also to the general practitioner.

MEDICAL AND SURGICAL REPORTS OF THE EPISCOPAL HOSPITAL. Edited by ASTLEY P. C. ASHHURST, M.D. Vol. III. Philadelphia:, Press of Wm. J. Dorman, 1915.

THE present volume of "Medical and Surgical Reports from the Episcopal Hospital", of Philadelphia, contains a great deal of interest and of value It would occupy too much space to give a complete list of the articles, but it may be said that they occupy all phases of the activity of a large general hospital, and are written by men who are obviously keenly interested in their hospital work, and are endeavouring to present the results of their experience in such a way as not to allow to go to waste the valuable clinical material of the hospital, and more than that, to do something to advance the science of medicine. The papers, as a whole, are on a high level. They include such subjects as lues, functional kidney tests, blood transfusion, various skin affections, fractures and dislocations in their various aspects, arthroplasty, different eye lesions, gunshot wounds of the chest and of the abdomen, and the Cæsarean operation. A number of excellent skiagrams are included. Here

and there one finds quite original work, as for instance, the observations of Moore upon the effect of atropine and of adrenalin on the flow of cerebro-spinal fluid in a case of fracture of the skull, and his conclusions concerning the nature of the cerebro-spinal fluid. Ashhurst has an interesting paper on cinematoplastic amputations according to the method of Vanghetti. There is also an interesting and well-written paper on the history of anæsthesia. Altogether it is a creditable book.

THE AMERICAN YEAR-BOOK ON ANÆSTHESIA ANALGESIA. Editor, F. H. McMECHAN, M.D., A.M. 420 pages and 250 illustrations. Surgery Publishing Company, 92 William Street, New York, 1916. Price $4.00.

THIS volume, the first of what one may hope will be a long series of such volumes, contains a large number of original articles bearing upon anæsthesia, not alone from the side of the anæsthetist, but also from that of the surgeon. Practically all of the papers, numbering some thirty, are valuable. It is in fact a series of small monographs. It would be quite impossible to give even an abstract of all of the papers, but a partial list of the contents will serve to indicate to those interested the nature and value of the work done. To begin with there is a long article by Lillie, of Worcester, Massachusetts, on the Physico-Chemical Theory of Anæsthesia, which gives a very good review of the various theories concerning the fundamental nature of the anæsthetic effect. Attached is a complete biography numbering one hundred and sixty references. Following this there are excellent articles bearing upon shock. One on the Peripheral Origin of Shock, by Mann, of Rochester, Minnesota (the work being done under Dr. Gatch, of Indianapolis). A second on Circulatory Disturbances due to operation and the Effects of Posture and Depth of Anæsthesia; these by Gatch. A third, on Blood Pressure and Anæsthesia, by McKesson, of Toledo. These papers, particularly those by Gatch, and Mann, bring out a lot of new work and are most valuable. Crile contributes an article on Anæsthesia, Anæmia, and Resuscitation. Yandell Henderson considers respiration in relation to Acapnia and Anæsthesia. Two good papers are given on Chloroform Syncope and Delayed Chloroform Poisoning; one by Levy, of London, the other by Graham, of Mason City, Iowa. Other valuable papers are the following: Alkaloidal Amnesia in Obstetrics, by J. O. Pollack and B. B. Matthews, of Brooklyn. Further Researches

in Novocain-Suprarenin Anæsthesia, by R. H. Riethmuller, of Philadelphia; Spinal Anæsthesia in the Cat, by W. T. Porter, of New Haven, Connecticut, and G. G. Smith, of Boston.

There are also half a dozen good practical papers especially applicable to the needs of the dentist; and some three or four papers on local anæsthesia as applied to the surgery of the ano-rectal region, hernia, prostatectomy, and the gasserian ganglion.

It is a book which not only every anæsthetist but every surgeon who is endeavouring to practise his art scientifically should have.

SYPHILIS. BY LLOYD THOMPSON, PH.B., M.D., physician to the Syphilis Clinic, Government Free Bath Hospital. 415 pages with 84 illustrations. Publishers: Lea & Febiger, Philadelphia and New York, 1916. Price $4.25 net.

DOCTOR THOMPSON has at the beginning of his book a short history of syphilis with its geographical distribution and prevalence. He then goes on with the different phases of the disease itself. There are separate sections on regional and congenital syphilis. In one volume the author has presented his subject in a practical and very concise manner. The chapters on diagnosis and treatment are especially good.

Laboratory methods of diagnosis are fully described and their value well expressed.

The book is one of the best of its size on syphilis, for medical student and practitioner alike.

Books Received

PUBLIC HEALTH NURSING. By MARY SEWALL GARDNER, R.N., Superintendent of the Providence District Nursing Association. With an introduction by M. ADELAIDE NUTTING, professor of nursing and health, and director of department Teachers' College, Columbia University. Publishers: The Macmillan Company, New York, 1916.

WITH A FIELD AMBULANCE AT YPRES : BEING LETTERS WRITTEN MARCH 7–AUGUST 15, 1915. By WILLIAM BOYD, professor of pathology, University of Manitoba. With illustrations. Publishers: The Musson Book Company, Wilton Avenue, Toronto, 1916. Price, $1.00.

Obituary

SIMON JOHN TUNSTALL, B.A., M.D.

Dr. Simon John Tunstall, who died recently at Vancouver, was born at Ste. Anne de Bellevue, in the province of Quebec, in 1852. He was educated at the old High School in Montreal and entered McGill University as a student in the Faculty of Medicine, graduating with honours as the first of his year in 1875. Dr. Tunstall practised for a short time at Papineauville, Quebec, and then went west to Kamloops, British Columbia, where he was in charge as medical attendant of a large number of men during the construction of the Canadian Pacific Railway. In 1892 he removed to Vancouver, where he continued to practise up to the time of his death. Dr. Tunstall always took a keen interest in professional and public affairs and was popular with confrères and patients alike. He became President of the College of Physicians and Surgeons of British Columbia, and was President of the Canadian Medical Association in 1904 when the annual meeting was held at Vancouver. He was also a director of the Vancouver General Hospital. Dr. Tunstall was a thorough and enthusiastic Scotsman, a descendant of Major Fraser who fought with Wolfe at the siege of Quebec, and deeply interested in all things pertaining to the welfare of the Highlanders and their descendants; he was President of the Caledonian and St. Andrew's Societies. His unbounded enthusiasm, universal cheerfulness and goodness of heart made him lots of friends. He is survived by a widow and five daughters.

FRANCIS J. HOGAN, M.D.

Dr. F. J. Hogan, who died of pneumonia at his residence at St. John, New Brunswick, on March 1st, was highly respected not only in St. John but throughout the Maritime Provinces. Though still a young man, he enjoyed an extensive practice and had won both popularity and an enviable reputation. Of an engaging personality, he made many friends and the news of his untimely death was received with profound regret. The esteem in which he was held by his confrères is evidenced by the fact that he was both president of the St. John Medical Society and Secretary of the New Brunswick Medical Society. After receiving the degree of

B.A. from St. Francis Xavier University, Antigonish, Dr. Hogan entered upon the study of medicine at Harvard, where he graduated in 1908. He then took a post-graduate course in surgery at Cornell University, after which he returned to St. John and commenced to practise. He leaves a widow.

DR. C. T. ALLEN, of Dorchester, New Brunswick, died suddenly on February 19th, at the early age of thirty-four years. Dr. Allen had been practising at Dorchester for about a year and was most popular and highly esteemed. He leaves a widow and three children.

DR. JOSEPH ANDREWS died at St. John, New Brunswick, on February 21st, in the seventy-fourth year of his age. He was a graduate of Harvard Medical College and practised for a time at South Boston. Later on, however, he returned to St. John, his native city, where he built up a large practice.

DR. EDGAR D. HARRISON died at Madoc, Ontario, on March 4th. Born near Glenora, Ontario, in 1866, he graduated as a teacher from the Ottawa Normal School and became principal of the public school at Moira. Three years later he entered Queen's University as a student of medicine and graduated in 1891. He at once went into practice at Madoc, where he built up a large connexion, particularly among the people of the neighbouring country districts.

DR. JOHN NIXON THOMPSON, of Omemee, Ontario, died January 22nd, in the seventy-first year of his age. Dr. Thompson graduated from Trinity Medical College, Toronto, in 1874 and had been in practice at Omemee for about thirty years. He is survived by a widow and seven children.

DR. A. D. MCCRIMMON died at Ripley, Ontario, on March 9th, in the eighty-second year of his age. He was born in Glengarry County in the province of Ontario of Scotch parentage in 1836 and graduated from McGill in 1869, taking the medal in biology. He immediately went into practice at Lucknow and was wonderfully successful in his treatment of cases of meningitis during the epidemic which occurred in Huron County. After practising for some years, Dr. McCrimmon went to Edinburgh where he obtained the degrees of M.R.C.S. and L.R.C.P. A serious illness, however, obliged him to give up work for a time and upon his re-

covery in 1895 he went into practice at Ripley. He is survived by his widow and seven children.

DR. CHARLES AULT died at Montreal on March 4th. He was born at Aultsville, Ontario, on July 15th, 1833, and graduated from McGill University in 1855. After practising for a time at Richmond, Quebec, Dr. Ault gave up the practice of medicine and went into business in Montreal.

News

MARITIME PROVINCES

DR. THOMAS JEAN BOURQUE, of Richibucto, New Brunswick, has been appointed a member of the Senate. Dr. Bourque has been in practice at Richibucto since 1889. He was elected to the House of Assembly in 1908 as member for Kent County and was reëlected in 1912.

ONTARIO

THE following cases of contagious and infectious disease were reported in the province during the past year: smallpox, 174 cases, 3 deaths; scarlet fever, 1,449 cases, 39 deaths; diphtheria, 3,212 cases, 284 deaths; measles, 21,977 cases, 227 deaths; whooping cough, 2,205 cases, 97 deaths; typhoid fever, 1,225 cases, 158 deaths; tuberculosis, 1,813 cases, 984 deaths; infantile paralysis, 190 cases, 27 deaths; cerebrospinal meningitis, 195 cases, 129 deaths.

THE transfer of the medical inspection of schools in Toronto from the Board of Education to the Board of Health was approved by the Municipal Committee of the Ontario Legislature on March 16th.

THE fourth annual report of the Institute of Public Health, London, which covers the twelve months ending June 30th, 1916, is the first report of the Institute to be printed, although typewritten copies for the three preceding years have been filed. These reports show continuous growth in every branch of the work of the Institute; the staff has been increased from five to thirteen members and

whereas in 1912-13 about 400 specimens were examined, in 1915-16 no less than 5,400 examinations of specimens were made. One of the principal objects for which the Institute was established was the education of the general public in matters pertaining to public health, and, with this in view, efforts have been made to reach all classes—members of the profession, medical students, nurses, teachers, clergy, and the public generally—by means of articles published in medical journals, addresses, lectures, circulars, and so on. More than one hundred and fifty lectures have been delivered before clubs, Y.M.C.A. meetings, farmers' institutes and other gatherings, and hundreds of newspaper articles have been published. In the laboratories of the Institute examination is made gratuitously of sputum, diphtheria cultures, water, milk, sewage, etc., submitted by medical officers of health, municipalities, or the military authorities of the district. Commercial analyses or clinical laboratory examinations of all kinds are done for individual persons upon payment of a small fee, or, in necessitous cases, without charge.

The work of the Institute is divided into a Division of Epidemiology, with a subdivision of Vital Statistics; a Division of Chemistry with Public Health Bacteriology and Sanitary Engineering as subdivisions; and a Division of Pathology. It is pointed out that the pathological division is a substitute for a future division of public health physiology, which will only become possible of attainment "when public health has emerged from the struggle with disease into the greater field of developing health". The subdivision of Vital Statistics naturally has been occupied during its first year largely with questions of organization. The purpose of this department is twofold: to conduct statistical investigations of public health questions, and to offer instruction in vital statistics and allied subjects. An investigation of the infectious diseases of the school children in London has been completed.

A course for the degree of D.P.H. has been organized by the Institute and was advertised in 1915. Of numerous applicants none were in a position to fulfil the complete requirements of the course exactly as laid down. Three candidates, however, were permitted to register for partial courses, to complete training in those subjects in which they were deficient, but for these the time requirements were doubled.

QUEBEC

THE ninety-fifth annual meeting of the Board of Governors of the Montreal General Hospital took place on Tuesday, February

20th. During the past year two members of the medical staff have given their lives on the field of battle—Lieutenant-Colonel R. P. Campbell and Captain Douglas Waterston, both members of the Canadian Army Medical Corps. Lieutenant-Colonel Campbell had been connected with the hospital ever since he graduated from McGill University in 1901, as interne, medical superintendent, clinical assistant, and chief of the genito-urinary department which he had developed to a high state of efficiency. Particulars were given in the March number of the JOURNAL of a memorial fund which it is proposed to establish in memory of Dr. Campbell who had endeared himself to everyone who knew him. Captain Waterston graduated from McGill in 1914 and had barely completed his term of office as interne of the hospital when he went to the front with the 9th Field Ambulance. Among those connected with the hospital who have volunteered for active service, or are already at the front, are forty doctors, seventy-nine graduated nurses, and thirty orderlies, and many members of the staff who are unable to go overseas are doing some kind of military work at home.

During the year 1916, 8,136 admissions were made to the hospital, the total number of patients receiving treatment being 8,520. On December 31st, 1916, there were 353 patients in the hospital, and 430 died during the year. The days of treatment given aggregated 144,271, or 7,717 more than in 1915. The death rate was 5·3 per cent., or if the deaths which occurred within forty-eight hours of admission are deducted, 3·5 per cent. In the out-patient department, 129,282 consultations were given and the number of new patients treated was 26,323. The ambulance responded to 2,782 calls. In the pathological department 391 autopsies were performed and 5,656 examinations were made for the attending staff of the hospital. In the department of radiography, 9,337 skiagraphs were taken, 220 fluoroscopic examinations were made, and 300 treatments were given.

The Board accepted with regret the resignation of Sir H. Montagu Allen, who for many years has been president of the hospital and chairman of the board of management. Sir Montagu has devoted much time and energy to the furtherance of the interests of the hospital. It is probable, however, that as chairman of the British Board of Pensions he will remain in London for some time after the conclusion of the war, and therefore he felt obliged to resign. Mr. Farquhar Robertson was elected to succeed Sir Montagu as president of the hospital.

An amendment to the charter of the hospital has been secured

which enables the board of management to make appointments to the staff of the hospital. In the past such appointments have been made upon the vote of the governors of the institution, an antiquated and cumbersome procedure that was distasteful to everyone concerned.

MANITOBA

A DELEGATION recently waited upon the provincial government with the request that a grant of $50,000 be made for the purpose of building an annex to the Winnipeg General Hospital for the accommodation and treatment of nervous and temporarily insane patients.

ALBERTA

THERE were reported in Lethbridge during the year 1916, 125 cases of typhoid, of which 97 developed within the city. The deaths from this disease numbered fourteen, the percentage being therefore 12·2. The deaths from all causes during the year numbered 193 as compared with 123 in 1915. An appreciable increase took place in the number of births, the figures being 420 in 1916 and 296 in 1915.

THE plans are being prepared for a new hospital at Fort McMurray, to be built by the Catholic mission there.

BRITISH COLUMBIA

THE fifteenth annual meeting of the Vancouver General Hospital was held on February 15th, in the University Building. The work of the hospital has developed enormously during the last two years and within the past twelve months its capacity has been increased by the addition of a Children's Annex in a separate building and a Convalescent Home for Incurables. In order to provide necessary accommodation for returned soldiers it has been decided to build a military hospital for the reception of soldiers from the province of British Columbia and a campaign for funds for this purpose is now being conducted. The average daily cost of maintenance per patient in the General Hospital during the year was $2.01. The financial statement showed a deficit amounting to $55,301.70, a sum which it is hoped to reduce during the present year. Over eight thousand patients were admitted to the hospital during 1916 and the number of days of treatment given was 176,941.

Four hundred and sixty-four deaths occurred, 101 taking place within forty-eight hours of admission. The total death rate was 5·6 per cent. Speaking of the work of his department, Dr. Graham director of laboratories, referred to the preparations being made to undertake work on the Lange Colloidal Gold Test. Dr. Whitelaw, director of the department of radiology, reported that 2,709 plates had been made during the year in the examination of 1,677 cases.

Dr. Arthur G. Price has been appointed medical officer of health of Victoria in succession to Dr. G. A. B. Hall, who is on active service has been granted leave of absence until the end of the war.

MEDICAL COLLEGES

Toronto University.

It is reported that in all probability the University Base Hospital will shortly leave Salonica and return to England. Lieutenant-Colonel W. B. Hendry has been in command of the unit since the departure of Colonel Roberts, who is now in charge of the Taplow Hospital.

Dalhousie University:

The Military Hospitals Commission has finally decided not to make use of the old Dalhousie Building on Carleton Street, Halifax, but to obtain accommodation for the returned convalescent soldiers at the Presbyterian College, Pinehill, near Halifax. The buildings there are on a beautiful site overlooking the waters of the North West Arm, one of the choicest spots in North America. Few students of Theology had been left this session and two of the professors had volunteered for military service about a year ago. The Commission, having decided that an additional hospital was needed, has arranged to erect temporary buildings on Camp Hill, on an excellent position on a portion of the common at Halifax.

ARMY MEDICAL SERVICES

Colonel J. T. Fotheringham, C.M.G., has accepted the appointment as Director of Medical Services to Invalids and has returned to Canada to take up his new duties at Militia Headquarters, Ottawa. He will have full charge of the medical and surgical treatment of returned soldiers.

THE following promotions in the Canadian Army Medical Corps are announced: To be temporary Lieutenant-Colonel, Major C. F. McGaffin. To be temporary Majors: Captain E. R. Selby, and Major T. P. Bradley (Canadian Militia).

IT is officially announced in the *London Gazette* that Lieutenant-Colonel George E. Armstrong, C.A.M.C., of Montreal, has relinquished his temporary commission in the Canadian Army Medical Corps.

ANNOUNCEMENT is made of the appointment of Colonel Lorne Drum as assistant medical director of the Fifth Canadian Division. Major C. A. Young, C.A.M.C., has been appointed D.D.M.S. of the Fifth Division.

CAPTAIN AMBROSE L. LOCKWOOD, R.A.M.C., was invested with the Military Cross by His Majesty the King at Buckingham Palace on January 24th for gallantry and meritorious service. When the war broke out Captain Lockwood was in Berlin taking a post-graduate course in surgery, and with him was Dr. Hepburn who was on his way home from Siam to Canada. Disguised as Americans, Drs. Lockwood and Hepburn were able to get away from Germany and, upon arriving in England, joined the R.A.M.C. During the first year of the war Captain Lockwood was attached to No. 12 Stationary Hospital, B.E.F. He then returned to Canada for a short time and has since been attached to a medical unit on the firing line. Captain Lockwood comes from Westport, Ontario, and is a graduate of McGill University.

THE Cross of the Legion of Honour has been awarded to Dr. Jules Albert Galliot of the French Army Medical Corps. Dr. Galliot, who at the time the war commenced was in practice at Notre Dame de Lourdes, Manitoba, was recalled to France and has been on active service ever since. On four occasions he has been mentioned in despatches.

THE Royal Red Cross of the Second Class has been awarded to Nursing Sisters Margaret Motherwell and Laura Holland. Miss Motherwell is the daughter of the late Canon Motherwell, of Niagara, and has been on duty in France for some time. Miss Holland was attached to the staff of a hospital at Lemnos during the Gallipoli Campaign. She is now on the nursing staff of the Canadian Hospital for Officers at Hyde Park Corner, London.

COLONEL SHILLINGTON, C.A.M.C., of Ottawa, has been given the command of the new Canadian Kitchener Hospital at Brighton, England. Colonel Shillington was A.D.M.S. at Shorncliffe and it was he who took the first Canadian medical unit to France.

IT is announced that Lieutenant-Colonel H. E. Munroe, formerly officer in command of No. 8 Canadian Stationary Hospital, has been given the command of the Canadian Military Hospital at Hastings.

MAJOR H. E. KENDALL, C.A.M.C., has been appointed to the command of No. 9 Stationary Hospital in succession to the late Lieutenant-Colonel McLeod.

THE death of Nursing Sister Constance Marie Sinclair, of Montreal, occurred at Etaples, France, on February 22nd. Miss Sinclair was attached to the Harvard unit, No. 22 General Hospital.

IT is announced that Colonel G. S. Rennie, C.A.M.C., of Hamilton, Ontario, has been appointed A.D.M.S. of the Canadian Division at Shorncliffe.

THE appointment is gazetted of Lieutenant-Colonel George MacDonald, M.D., as General Officer Commanding Military District No. 13. Colonel MacDonald was formerly in command of the 12th Mounted Rifles and returned from the front a short time ago.

THE Military Medal has been awarded to the following members of the Canadian Army Medical Corps: Sergeant E. A. Doughty and Private F. Wilson.

THE appointment is gazetted of Lieutenant-Colonel and Honorary Surgeon-General G. S. Ryerson as Honorary Colonel of the Army Medical Corps, in succession to the late Hon. Sir Frederick W. Borden.

CAPTAIN C. A. PUBLOW, C.A.M.C., of Picton, Ontario, has been appointed adjutant at the Bramshott Military Hospital. Captain Publow went overseas as medical officer of the 155th Battalion.

CASUALTIES

Wounded

CAPTAIN N. K. McIVOR, C.A.M.C., of Winnipeg. Captain McIvor is a graduate of the Manitoba Medical College and was in practice at Winnipeg. He left for the front last May as second-in-command of an ambulance corps.

CAPTAIN R. M. SHAW, C.A.M.C., of Sault Ste. Marie, Ontario.

Canadian Literature

ORIGINAL CONTRIBUTIONS

Dominion Medical Monthly, January, 1917:

The protein poison in immunity and disease	Victor C. Vaughan.
Pneumonia—Successful treatment . . .	A. P. Ship.
Milk and communicable disease . . .	L. R. Williams.

Medical Societies

ONTARIO MEDICAL ASSOCIATION

THIRTY-SEVENTH ANNUAL MEETING AT TORONTO, MAY 30TH, MAY 31ST, JUNE 1ST, 1917

PRELIMINARY PROGRAMME

Wednesday, May 30th

10 a.m.	Meeting of Committees.
11 a.m.	Business Meeting.
12:30	Luncheon in Building.
2 p.m.	General Session.
	"Symposium on Venereal Diseases," Drs. Connell, Begg, Goldie, Hair, and others.
	Address in Gynæcology, Dr. Chipman, Montreal, "Treatment of Prolapsus Uteri."
4 p.m.	Garden Party.

8 p.m. General Session.
President's Address.
Address in Medicine, Dr. Christian, Boston, "Nephritis and Diuretics."

Thursday, May 31st

9 a.m. to 12 Meeting of Sections.
2 p.m. General Session.
Address in Surgery, Dr. W. W. Babcock, Philadelphia. "The evolution of the surgery of the Biliary System."
Laryngectomy, Dr. McKenty, New York.
3:30 Business Meeting.
4:30 Garden Party.
8:00 Evening Session.
"Recent advances in the operative treatment of Intracranial conditions," Dr. William Sharpe, New York.

Friday, June 1st

9 to 12 Section meetings.

SECTION IN GYNÆCOLOGY AND OBSTETRICS

"Demonstration of the right oblique diameter in midwifery," Dr. McCabe.

"Treatment of fibroids," Dr. Angus McKinnon.

"Ligamentous suspension with intra-abdominal treatment of cystocele in uterine prolapse," Dr. Klotz.

"Some points in the pathology of the endometrium," Dr. B. P. Watson.

"The toxæmias of pregnancy," Dr. Frawley.

"Cæsarian section," Dr. McIlwraith.

"Retained placenta," Dr. W. J. Mabee.

Other papers are promised by Dr. Holmes, Dr. Oliver, and Dr. Ernest Williams.

SECTION IN SURGERY

"Varicose veins," Dr. E. R. Secord.

"Mortality incident in surgery,", Dr. J. K. McGregor.

"Surgical treatment of gastric ulcer," Dr. D. C. Balfour.

"Post-operative treatment of abdominal cases," Dr. I. Olmsted.
"Gastric stasis, its clinical significance," Dr. W. J. McDonald.
"The cystoscope, an essential in genito-urinary surgery," Dr. Colin L. Begg.
"Exophthalmic goitre," Dr. H. Lackner.
"Surgical kidney," Dr. Mowbray.
"Suprapubic prostatectomy," Dr. N. H. Beal.

SECTION IN MEDICINE

"Gonorrheal septicæmia," Dr. Stobie.
"Blood urea," Dr. Campbell.
"Cyclic vomiting," Dr. J. Loudon.
Other papers have been promised by Drs. W. P. Caven, Minns, Bates, McPhedran and Richardson.

The Section in Ear, Eye, Nose and Throat has also arranged a good programme and exhibition of cases.

HALIFAX MEDICAL SOCIETY

THE Halifax Medical Society held its third sessional meeting on January 17th in the Victoria General Hospital, the president, Professor Fraser Harris, in the chair.

A series of very interesting cases were shown by Dr. G. H. Murphy, who exhibited skiagrams of several bone graftings carried out by him. The results were surgically important and very encouraging to workers in this field of plastic surgery.

A case of Dr. Murphy's, of chronic loculated tubercular peritonitis which had been treated by opening and draining, elicited some fruitful discussion.

The fourth meeting was held in the University Building on February 21st, when the President contributed a paper on "Some insufficiently considered aspects of the life and work of Harvey". Harvey's endeavours to scrutinize blood vessels in transparent marine creatures and in the fœtal chick having been described, the rest of the paper was mainly an analysis of the claims put forward by Italian writers to recognize Andreas Cæsalpinus (1519-1603) as the discoverer of the circulation of the blood. A number of writers contemporary with Harvey, some lay, some medical, were quoted to show that in their opinion the merit of the discovery was due exclusively to Harvey.

Professor Cameron, of the Chair of Anatomy, gave an import-

ant communication on a case of absence of the corpus callosum. The paper was illustrated by lantern slides. The brain was first seen in the dissecting room so that no clinical history was obtainable. Dr. Cameron showed that the brain in question was poorly developed as regards the depths of its sulce and the amount of its grey matter.

From an extended study of the relationship of the corpus callosum to the cerebral cortex, the author contended that according as the cortex is well developed so is the corpus callosum. Professor Cameron regards the corpus callosum as the commissure absolutely necessary for the exhibition of any degree of high mentality. He gravely questioned those accounts of the intellectual capability of persons in whom the corpus callosum is absent. The paper elicited an interesting discussion on the whole subject of the two hemispheres acting as a single percipient and intellectual mechanism.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

THE fifth regular meeting of the society was held Friday, December 1st, 1916, Dr. W. S. Morrow, president, in the chair.

PATHOLOGICAL SPECIMENS: Series by Dr. Horst Oertel.

1. Cancer of the pylorus illustrating the close relation of cancer formation to ulceration. There has been a tendency lately to emphasize the relation of ulceration to cancer formation and some have gone so far as to believe that practically all cancers of the stomach originate on the bases of old ulcers. About this there is still discussion and I myself would not unreservedly accept the statement of some surgeons that practically all cancers are due to old ulcers, because not in every instance of this combination has proof been given that the ulcer is the starting point of the cancer. Ulcerations may be secondary as a result of early vascular changes and obliterations which take place in inflamed cancers, making determination as to which is primary very difficult. But even taking these points into consideration there can be no doubt that a certain number of cancers take their origin from ulcers and the specimen which I present to-night makes this extremely probable for the reason that this stomach has several ulcers, some of which are plain and healed without cancerous transformation. Besides these healed ulcers, with a smooth perfectly plain base, there is one, large, with a deep central, crater-like excavation and fungoid edges presenting a cancerous growth.

2. The second specimen is also a cancer of the stomach showing, while itself quite characteristic and perfectly plain, a rather

unusual method and extent of metastases. They are confined entirely to the liver where they have assumed tremendous proportions, replacing most of it. It is difficult to say what determines this isolated extent of these metastases. The whole question of metastasis is by no means settled. On the whole, while we accept the idea of metastases either by lymph or the blood vessels there are still a great many points which are obscure as to the course or location, seat and extent. Where large masses of tumour tissue break directly into lymph or blood vessels they are usually distributed in the direction of, and around, the current. But what determines their seat and extent in other more obscure and irregular generalizations?

The idea occurs to me that genetic relation may be a factor. In other words those organs that are in close, early genetic relation to the organ from which the tumour grows are perhaps a more suitable soil for its metastases to grow in. The liver is really only a developmental outgrowth of the small gut and we know that tumours of the gastro-intestinal tract metastasize with predilection, even against lymph stream, in the liver. On the other hand cancers of the uterus, etc., rarely metastasize in the liver and that may be at least partly due to their much more distant genetic relation.

A detailed discussion of this matter would here be out of place, I mention it, in passing, in connexion with this, in this regard, interesting exhibit.

DEMONSTRATION: The localization of foreign bodies, by Dr. W. A. Wilkins.

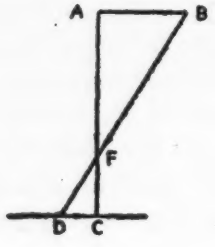
I wish to illustrate to-night with the aid of lantern slides, a method of localization, which, although it is not a new method, is not as well known as it should be. It is a modification of the cross-thread method of localization introduced by Sir James Mackenzie Davidson when the Röentgen ray was in its infancy, and one which we found to be of very great service in France. No expensive nor cumbersome apparatus is required, and the measurements can be quickly determined by means of a pencil and paper, or read from a previously determined scale. The only special apparatus required is a flat piece of board, slightly larger than the plate which is to be used, over which two wires are stretched intersecting one another at right angles at the centre of the board.

The method of procedure is as follows: A screen examination is first made to determine the general situation of the foreign body. A small plate is placed on the cross-wire board, underneath the

wires, and the tube brought into position over it. This is done by placing the centre of the target vertically over the intersection of the wires, with the long axis of the tube directly over and in the same vertical plane as one wire, and at right angles to the vertical plane of the other wire. The distance of the centre of the target from the plate is measured and noted. Any reasonable distance may be utilized, but we found that twenty inches was a practical one. The region containing the foreign body is then adjusted over the plate in such a manner that the foreign body will be as nearly as possible directly over the intersection of the wires. During this manœuvre, care must be exercised that neither the tube nor the board is disturbed. The first exposure is made and the tube is displaced horizontally a distance of three inches. This displacement may be backwards, forwards, inwards or outwards, as long as the movement maintains the distance of twenty inches from the plate, directly over one wire and at right angles to the other. The amount of displacement may be greater than or less than three inches to be satisfactory. The direction of the displacement and the distance displaced must be noted. Without disturbing the patient or changing the plate, the second exposure is made, and the plate sent to the dark room.

The purpose of the cross-wires is to enable us to have similar fixed marks on the plate and on the patient from which we can make our measurements. Before placing the patient in position, the wires are inked. When the part is laid on these wires, an impression of them is accordingly registered on the skin of the patient. The wires are so close to the plate that although two exposures are made, the effect of these exposures will appear on the plate as only one shadow of each wire.

When the plate comes out of the dark room, we proceed to work out the depth of the foreign body by triangulation, reconstructing on paper the paths of the rays and the conditions of the exposure. The other measurements are made directly from the cross-wires. The diagram will serve to illustrate this reconstruction:



"A" represents the position of the tube during the first exposure, "F" is the foreign body, and "C" the shadow of it cast on the plate, the path of the rays being represented by "AFC". "B" is the position of the tube during the second exposure, and "D" is the shadow cast by the foreign body, the path of the rays being represented by "BFD". Referring to this diagram, we have two similar right angle triangles, namely, "AFB" and "DFC", which are between the same parallels, and accordingly the base of one triangle is to the base of the other triangle, as the perpendicular height of the one is to the perpendicular height of the other. The base of the first triangle is three inches, namely the distance which the tube was displaced between the exposures. We ascertain the base of the second triangle by measuring on the plate the distance between two similar points of the two shadows. For the sake of an example, we will assume that this was found to be one quarter of an inch. We next proceed to represent in figures, the perpendicular heights, as follows: Let x represent the distance of the foreign body from the plate. Then the remainder of the distance, that is, from the foreign body to the centre of the tube, must be 20 minus x, for the total distance from the centre of the tube to the plate was 20 inches, measured before the exposure was made. The equation can be expressed algebraically as follows: the base of one triangle (3 inches), is to the base of the other triangle ($\frac{1}{4}$ inch), as the perpendicular height of the one ($20-x$), is to the perpendicular height of the other, that is,

$$3 : \tfrac{1}{4} :: 20-x : x$$
$$3x = \tfrac{1}{4} \times 20-x$$
$$12x = 20-x$$
$$13x = 20$$
$$x = 1\ 7\text{-}13\text{ths, or approximately } 1\tfrac{1}{2} \text{ inches.}$$

The foreign body, therefore, was approximately one and a half inches from the plate when the exposure was made, and as the plate and the skin were in close contact, it is sufficient for practical purposes to state that distance as the depth of the foreign body beneath the surface. If an interval separates the plate from the surface of the body, it must be measured and deducted from the answer obtained; for it must be remembered that the degree of separation between the shadows is dependent upon the distance the foreign body is from the plate.

Before proceeding to the other measurements, it must be stated that the two shadows of one foreign body naturally cannot represent the true position of the foreign body. To obtain this, we draw

a line on the plate from one shadow of the foreign body, to the point of intersection of the shadow of the two cross-wires; and another line from a similar point of the second shadow to a point three inches (the distance the tube was displaced), inwards, outwards, upwards or downwards, depending upon the direction in which the tube was moved. Where these two lines cross, is the real position of the foreign body, and from this our other measurements are taken. Perpendiculars are dropped to each of the shadows of the cross-wires, measurements are made, and these measurements transferred to the skin of the patient, with the ink marks of the cross-wires as guides. A final mark is made on the skin to represent the spot beneath which the foreign body lies, at the depth determined.

PAPERS: Work in the Army Medical Corps, Canadian Expeditionary Force. Major W. H. P. Hill (to be published later). Captain D. Hingston (published in this issue).

THE sixth regular meeting of the society was held Friday, December 15th, 1916, Dr. W. S. Morrow, president, in the chair.

CASE REPORTS: 1: Diabetes in a child of three years.

2. Eczema in a child, with sudden death, by Dr. L. M. Lindsay.

These case reports were published in the February number of this JOURNAL.

DISCUSSION: Dr. F. M. Fry: As to the case of diabetes, the child was admitted to the Royal Victoria Hospital in July and stayed for four or five weeks. Partly owing to the training she had received at the Children's Memorial Hospital she came in sugar-free. She was certainly ill nourished and before I saw her she had been given a fairly mixed diet which on being increased gave rise to sugar in the urine. We then gave a starvation diet for a day which rendered the urine sugar free. The child remained sugar-free for some five or six days on a generous though restricted diet. At no time was there any trace of acidosis. The child maintained her weight for some time and then gained a little. It was very striking that, as has been noted elsewhere, as soon as the child had been made sugar-free the extreme appetite for solids as well as fluids ceased. With increase of diet the child for a few days was passing a moderate amount of sugar. She was removed from the hospital and until admitted to the Children's Memorial Hospital the second time was without supervision. The response to treatment in this case was very marked; nevertheless six months after the child came

under observation she died. This child twice passed out of supervision and what might have occurred had we had full control remains problematical. Dr. Joslin advises seeing a bad case at least three times a day.

Dr. E. H. Mason, who made the tests in this case, found a hypogylcæmia.

As to the case with eczema I have never seen a case of sudden death in this disease, although we certainly have seen a great many cases. Of course we all know that these cases are not a pure skin disease but depend upon disturbed nutrition and metabolism of the child. I do not know how an enlarged thymus could affect the metabolism and I was wondering if it was a mere coincidence that the eczema and the enlarged thymus occurred simultaneously.

Dr. G. G. Campbell: I do not see the relation between eczema and sudden death from a large thymus in this case. We know from collected statistics of a great many hundreds of thousands of skin diseases, that eczema forms, taking all ages, 40 per cent. of the whole and that the percentage is much higher in infants than in adults. Consequently in children dying in status lymphaticus a large proportion of those having some skin disease, would have eczema. As to eczema being a disease due to malnutrition, indigestion or some general disturbance, most men who see a great deal of skin work will agree that is it very often the healthiest children, plump, fat, and apparently in absolutely good physical condition, who are great sufferers from eczema. There has never been established any relation between sudden death and the occurrence of eczema.

PAPER: Functional and professional reëducation of wounded and disabled soldiers returning to civil life (illustrated with lantern slides), by Dr. E. M. von Eberts.

This paper appeared in the March number of this JOURNAL.

THE seventh regular meeting of the society was held Friday, January 5th, 1917, Dr. W. S. Morrow, president, in the chair.

LIVING CASES: 1. Congenital cardiac defect in a child, by Dr. H. B. Cushing.

This little boy, eight years of age, came before me this summer for the ordinary routine examination for admission to one of the institutions in the city. His aunt, who brought him, declared that he had had no sickness and was always healthy. However, on examination, I was surprised to find that there was serious trouble with his heart. After investigating more closely it became evident

that the apex was over on the right side and that the dulness was decidedly over to the right. On turning to the other solid organs the liver was easily outlined over to the left side and the dulness of the spleen on the right with tympany from the stomach over to the right also. In other words, that he had a complete transposition of the viscera. To confirm this I had an *x*-ray plate taken and it shows the position of the stomach, after a bismuth meal, and the heart, liver, etc. I was interested to know whether the patient was right or left handed but he showed himself to be definitely right handed in every respect. Apart from this complete transposition of the viscera there was evident an anomaly of his heart. On putting the hand over the heart it is immediately noticeable that there is a very coarse thrill which is felt all over the præcordium, most distinctly over the third and fourth interspace about the middle of the heart; this is definitely systolic in character. On listening with the stethoscope, all over the chest but most marked over the area where the thrill is, there is a very loud systolic murmur, and this can be heard with the ear a little way from the chest. This murmur is not transmitted in any special direction and can be heard all over the chest. The pulmonary second sound, which in this case is on the right side, is accentuated. His heart is not greatly enlarged, there is a slight enlargement to the left and right laterally but no special enlargement at the base such as is found in many congenital lesions. Electro-cardiographs were taken and showed the ordinary findings which are characteristic of transposition of the viscera; that is, the first lead has an inverted picture and the second and third leads are transposed. Apart from that the tracings show nothing special except a sinus arrythmia. These two signs, the systolic thrill over the centre of the heart and the systolic murmur over the same region are, as you all know, usually taken as indicating a defect in the interventricular septum and it is probable that this is the condition of this boy. The question arises, how is it that this child shows no special involvement of his general health and development? He is almost average weight and height, as given by Holt. In running and playing with other children, however, he gets a very bright colour in his face; apparently there is a slight tendency to cyanosis.

Discussion: Dr. Maude E. Abbott: There are several points of great interest in this case. Kuchemeister has collected 125 cases of congenital dextro-cardia. Nægele distinguishes three kinds of dextro-cardia: first, dextro-versio, a simple pushing over of the heart to the right side from mechanical causes; second, congenita.

mirror-picture dextro-cardia, such as is seen in this child in whom all the viscera are completely transposed upon themselves. In this form the apex points to the right and is in the fifth right interspace but is formed by the left (pulmonic) ventricle; this type is associated with a directly inverted electro-cardiogram, which is here a true diagnostic feature. The third type is also a true congenital dextro-cardia, but the heart is not transposed upon itself but lies on the right side of the chest, the apex pointing to the right but formed of the "right" (caval) ventricle. This type represents a simple arrest of embryonic development in which the heart retains its original embryonic position more to the right than to the left of the median line. It is usually associated with other grave cardiac anomalies and transposition of the other viscera is usually absent. The electro-cardiogram is that usually considered characteristic of congenital cardiac disease, namely, one indicating great hypertrophy of the left ventricle.

Dr. F. M. Fry: I saw this case of Dr. Cushing's in the summer and the only point upon which I would differ is the interpretation of the signs. Where the heart is on the right side and you get a murmur which is loudest over the third right space, and there, too, a thrill is best felt, I would claim that those two signs are suggestive of pulmonary stenosis. I have at present three cases of congenital defect. One a girl of fifteen, said to be well, has complete transposition of the viscera. Her heart is on the right side and there is over her pulmonary cartilage a very marked thrill which is best felt there and a murmur best heard over her third right cartilage. In the two other cases the only striking feature is a very loud long systolic murmur heard all over the heart and all over the thorax, even in the back; and in those two cases there is no thrill whatsoever and no point of maximal intensity to the murmur except over the heart as a whole, and these cases probably have a congenital defect of the interventricular septum and no pulmonary stenosis. I would ask if in this boy it may not be that the thrill and murmur are suggestive of pulmonary stenosis in addition probably to septal defect.

Dr. H. B. Cushing: I think Dr. Abbott could answer Dr. Fry better than I can as to what the condition is in this boy's heart. It seems very like a pure septal defect; the thrill and murmur, while they are over the third cartilage, are much more distinct lower down than over the centre of the heart, not the base. And again in pulmonary stenosis we usually have right-sided hypertrophy, and this case shows no evidence of this at all. For these reasons it made me think that the signs were more likely due to a septal defect.

Dr. Maude E. Abbott: I agree with Dr. Cushing in his diagnosis of this case. The conditions point much more strongly to a septal defect than a pulmonary stenosis; the localization of the thrill with maximal intensity in the fourth interspace, certainly not higher up than the third rib, is very suggestive, as is also the absence of any considerable degree of cyanosis.

2. Illustration of Exhibitor's modification of the conjunctival flap in cases of cataract extraction complicated by pyogenic infection of the conjunctival sac, by Dr. Gordon M. Byers.

Pathological Specimens: Dr. C. T. Crowdy, Royal Victoria Hospital. Tumour of the kidney.

The patient from whom these specimens were obtained was fifty-four years of age. About a year ago he developed a severe diarrhœa which continued for about four months; then he got better but it left him with what he described as "a dulness of the stomach with evolution of gas". This progressed in severity and about the first part of last August he noticed in the evenings slight œdema of the lower extremities, which disappeared in the mornings. A few weeks later this œdema became more severe and persistent and at the same time his diarrhœa recurred. On September 2nd he was admitted to the Royal Victoria Hospital in the service of Dr. W. F. Hamilton.

In his family history it is interesting to note that both his mother and grandmother are reported to have died of "malignancy of the abdomen". The patient stated that he had lost much weight, a fact which was quite evident on admission. The abdomen was very prominent and over it, particularly on the right side, there were extremely large dilated veins, which occurred from over the iliac crests up to the costal region. There was marked œdema of the lower extremities and of the scrotum. Incidentally he also had a very marked bilateral hernia and a small umbilical hernia. The abdomen on palpation was not extremely tender but was dull on percussion and gave all the signs of fluid. On careful palpation a large oval mass could be made out in the region of the right kidney. Cystoscopic examination showed that the bladder wall was inflamed. Previous to this he had given a history of having passed clots of blood in his urine. The ureters were catheterized separately and laked blood was found coming from the right ureter. The urine from the left kidney did not show anything abnormal. Dr. Hamilton diagnosed tumour of the right kidney and thrombosis of the vena cava inferior. Dr. Garrow concurred in this but did not con-

sider the case operable and the patient remained in hospital until December 8th, gradually losing strength, and died on that day.

At autopsy a few hours later, the abdomen was found to be full of a straw-coloured fluid roughly about three litres. The liver was not unusually large and extended 7 cm. below the ensiform cartilage. In the region of the left kidney there was a large tumour mass. We dissected down on the inferior vena cava as it had been suspected that this vessel was thrombosed because of the dilated veins on the surface, etc., and it was found to be quite firm and filled by a clot. We therefore took the organs out *en masse* and dissected them out from behind.

As you can see, the right kidney is markedly enlarged and presents a nodular surface with a thickened capsule; on section it is seen filled with large nodular masses of a rather yellowish fatty appearance, which at autopsy were quiet soft. The gross appearance of the tumour suggested a so-called hypernephroma but the adrenal on this side did not show any involvement. The inferior vena cava was then opened up and it was found to be filled with a soft, stringy, rather semi-solid material, which was removed for preservation and section. In the upper part of the inferior vena cava above the liver you can still see this material in situ. On further dissection it was found that the growth extended from the kidney through the right renal vein into the inferior vena cava and the end of this plug of tissue can still be seen projecting from the renal vein into the lumen of the vena cava. One of the tumour masses evidently had ruptured into a branch of the right renal vein and in this manner the metastasis had spread. The vena cava is filled down to its bifurcation and the growth had extended into the upper portion of the right iliac where it is particularly adherent. It extended upwards posterior to the liver into the right auricle and through this in a continuous cord into the superior vena cava. While we could not trace any direct connexion through the right ventricle, we found in the lungs, particularly in the right, some of the same material in the pulmonary vessels and this could be felt as nodular masses and seen distinctly within the vessels. Besides this extension there were a number of small metastases in the liver and one also in the spleen. Interesting also is the fact that the left kidney shows no involvement whatsoever and is apparently a healthy-looking organ and had functionated very well. It is evident therefore that the inferior vena cava cannot have been completely blocked during life as the circulation of the left kidney was kept up extremely well.

Microscopical examination shows that the tumour is more

properly to be regarded as an adeno-carcinoma of the kidney, and the pictures both of the tissue from the inferior vena cava and in the metastases also seem to bear this out.

Metastases from primary carcinomata of the kidney are not very extensive, and as you can see in this case the greater part was almost directly by extension through the vessels only. In the lung, besides the intravascular metastases, small intravascular nodules were found, possibly of lymphatic origin.

A detailed report on these findings will be published at a later date.

DISCUSSION: Dr. Maude E. Abbott: There is a case in the Museum which is a duplicate of this. It occurred in Dr. Adami's service at the Royal Victoria Hospital and was diagnosed by him as hypernephroma. There was a huge tumour of the right kidney with extension into the inferior vena cava and right auricle of the heart. The inferior vena cava was thrombosed below and plugged above by a firm tumour mass, not as in this case a loose mass, but very firm about 3 cm. in diameter and extending up into the heart, making a scar of adhesion on the wall of the left auricle where the two surfaces had been broken apart.

PAPERS: 1. Subacute combined sclerosis, by Dr. G. S. Mundie.

This paper appears on page 311 of this issue.

DISCUSSION: Dr. A. G. Morphy: Dr. Mundie has not left much to be said on the subject of combined sclerosis. I would like to add my own testimony to his with regard to the necessity of noting carefully the symptoms which are so often put down to neurasthenia—the numbness, tingling, drowsiness, etc. It would be very interesting to follow up these cases from month to month; unfortunately they disappear from view and we lose sight of them. As regards the diagnosis, so far I have not found it an easy matter or as comparatively easy as Dr. Mundie would lead us to believe. It requires a great deal of care and the experience from having seen a great number of cases. In some cases, of course, it is comparatively easy, but if you have a case in which there is no Babinsky but there is Romberg and ataxia, it might be very easily confounded with tabes. In Case No. 3, the patient had rheumatism, so-called, in the legs, ataxia, difficulty in walking, the reflexes were absent and there was no Babinsky. Such a case, even in the absence of Argyl-Robertson pupil, might easily be confounded with tabes.

DR. W. E. ENRIGHT: I had the fortune to have one of these cases under my charge for a time and it is of considerable interest to me to hear the ultimate history. Although a blood examination

showed no marked anæmia the patient had all the appearances of a well marked anæmia; he was a tailor by trade and seemed to think that his condition had been brought on by his occupation. The immediate onset was caused by a holiday celebration shortly after the Christmas and New Year holidays and began after participation in some Scotch dances. He felt that his condition was due to this unusual activity. Despite treatment the condition did not clear up. Noting the anæmia I prescribed iron and strychnia and he really appeared to be doing well on this for a while. However, it as not for long, and as I had a suspicion of tabes I referred him to Dr. Mundie who soon cleared up the diagnosis; but the case went on to a fatal termination. He suffered a great deal mentally during the progress of the disease.

2. Observations on wounds of the abdomen at a casualty clearing hospital, by Major E. W. Archibald.

This paper appears on page 298 of this number of the JOURNAL.

DISCUSSION: Lieut.-Col. A. MacKenzie Forbes: I am glad that I have had the privilege of hearing Major Archibald, as I am particularly interested in war surgery. Unfortunately, however, I have had very little experience in abdominal surgery in the war zone, as in France I was always situated on the lines of communication, and there you see more of the surgery of the bones, joints, etc. I have always been very ambitious to go to a casualty clearing station where you see the surgery pictured by Major Archibald. To show you how rare are abdominal lesions in the hospitals on the lines of communication I may say that I was personally interested in a few more than 2,500 patients in France and of these I can recall only seven as being abdominal injuries. All other abdominal cases had either died at the front or been cured in the casualty clearing stations. The abdominal wounds which I saw were in the convalescent stage and only one was of particular interest. This patient had an oblique wound in the abdomen penetrating the peritoneal cavity. According to the history which was received from the front with this soldier, the first part of the small bowel had been penetrated by a projectile necessitating the excision of several inches of the injured jejunum at a casualty clearing station. The patient got along very well for some time. He then unfortuately developed some pulmonary symptoms which Lieutenant-Colonel F. G. Finley diagnosed as being due to an abscess of the lung, from which the patient eventually died. The bullet apparently had entered the abdomen, gone through the upper part of the jejunum into the thorax and had lodged in the lung apparently without having produced symptoms.

Here it remained for some weeks and only eventually caused an abscess of that organ. Abdominal cases are all attended to at the front and as one gets nearer the base the proportion is smaller and smaller, till at the base hospitals they are seen but rarely.

Major E. W. Archibald: Dr. Lauterman asked concerning the effect of adrenalin, camphor and other stimulants in cases of shock; we tried these rather faithfully, and found them in cases of severe shock of no value; in light shock they did seem to do good but as we always combined these with an intravenous salt infusion, it was difficult to tell to which remedy the good effect was due. What interested me particularly in the question of shock was the problem of combating the severer grades of the condition. If one could make certain of the exact cause of shock we would possibly be able to institute a proper remedy. I tried amyl nitrate in two cases on the theory that shock is a spasm of the peripheral arterioles. I tried the head-low position frequently, without effect. I tried massage of the abdomen in one case—rather deep pressure kept up (rhythmically) for ten minutes at a time over an hour and a half with short intervals, apparently without effect, hoping that the collection of blood in the splanchnic veins might be forced on to the heart. I thought of trying a see-saw movement, by which the patient's head would be alternately lowered and raised, with the same idea of forwarding the abdominal blood by means of gravity; but it seemed obvious that that was doomed to disappointment from the fact that the head-low position accomplished nothing. Intravenous salt solution we faithfully tried, it nearly always made an impalpable pulse palpable, or a fluttering pulse half respectable; it frequently raised blood pressure from 40 say up to 75 or 80, but its effects were transitory and the patient would fall back into his previous state inside of an hour or less. I tried gelatin, 25 grams to the litre of salt solution, with the idea of giving to the blood a substance of a colloid nature such as is the blood itself. That held the blood pressure up very much longer than the pure saline, frequently from four to six or eight hours, but the ultimate result was not changed. All these things were tried in an effort to combat severe shock; but the key to this problem has yet to be found.

With regard to Dr. Hall's question as to the effect of morphine on acidosis, I am very sorry to say that we never carried out urinary tests of that sort, or indeed many of any sort. We were only six men and with a convoy of 125 to 200 at a time, it was pretty steady mechanical work, doing dressings, operating, cleaning up generally; so that for this and other fine details we did not have the time, save only for blood pressure records which we took faithfully.